VOL. XXIII NEW YORK—THURSDAY, SEPTEMBER 1, 1910—CHICAGO No. 9

THE AUTOMOBILE

MUNSEY TOUR FINISHED

COVERED with the dust of ten States through which they had passed, the contesting column of automobiles in the Munsey Historic Tour of 1910 that started from Philadelphia, August 16, paraded through the streets of Washington, D. C., late Saturday afternoon, escorted by nearly 100 flag-decked and spotless machines belonging in the capital city. There were two absentees, the Glide entry, which could not be repaired in time to reach Washington on account of the distance from which the spare parts had to be shipped, and the Elmore.

The K-R-I-T, Maxwell runabout and Regal cars, which withdrew at various places along the route and continued as non-contestants, were all in line and running smoothly. The Elmore, owned and entered by Frank Hardart of

Escort Into Washington.

At Bluff Point near Plattsburg.

At the control at Montpelier, Vt.

Selden pilot car near Tunkhannock

Great Western waiting for the brake test

Brush made a brave showing despite tire trouble

Philadelphia, which was disqualified by reason of the failure of the factory management to file its stock certificate covering the car, broke a spring near Harrisburg and could not finish. The Great Western, Crawford and Staver-Chicago, which were heavily penalized on the road, finished the tour with a fine showing of power and running quality.

The two contesting Brush runabouts, three Fords, Warren-Detroit, Maxwell touring car, Moon, two Washingtons, Pierce-Racine, Enger, Ohio, Inter-State, Columbia, Corbin, Cino, Stoddard-Dayton, Kline-Kar and Matheson, seven of which had earned some sort of a penalty, constituted the main division of the tour and were given ovations all along the line.

The official cars were also accorded their full share of the honors. The diminutive Brush runabout, which carried the official photographer and which unofficially came through with a clean road and mechanical score; the powerful Selden, which carried confetti from one end of the route to the other without skip of any kind, under the guidance of J. D. Murphy; the two E-M-F's, which acted respectively as pilot and press cars and which monopolized all the real accidents of the tour outside of the mishap to the Great Western; the starter's car, an Ohio, which had better luck on the road than its team mate in the contesting division, having a spotless record; the Washington car, which carried part of the press representatives and which was driven by Jack Welsh without even a semblance of tire trouble; Referee Ferguson's carriage, a Columbia, which made the run without unofficial penalization, and the giant Thomas Flyer, guided by the hand of George R. Miller, the same engineer who steered the three-ton machine when it won the famous race from New York to Paris, were all repeatedly cheered on the way to their resting place in the official garage.

At the finish of the road work thirteen cars had perfect scores, according to final announcement. These were: Columbia, two Washingtons, two Fords, Corbin, Brush, Enger, Cino, Stoddard-Dayton, Maxwell, Kline and Matheson.

Four cars were penalized for the last day's work as follows: Warren-Detroit, 11 points for work on stay rod and magneto, bringing its total to 15 points. Great Western, 66 points for lateness at noon control and work in repairing a spring, a total of 2,229 points. The Ohio, 3 points for work on a rod, giving this car a total of 79 points. The Moon also earned one more demerit for motor stop, making its total 3 points for its work on the road.

At the conclusion of the run the cars were turned over to the technical committee for a most searching examination. It was estimated that it would require an average of 45 minutes' work on each car to determine its exact condition as compared with its shape when commencing the tour.

The Regal entry's trouble was a broken spring, the accident happening near Bloomsbury. The repair work was accomplished so quickly that much regret was expressed that the car did not continue in the contesting division, as the penalization would have been much lighter than the 1,000 points charged for its withdrawal.

The technical committee, consisting of E. L. Ferguson, James Hemstreet and Joseph Tracy, went to work immediately on the cars and following the spirit that has actuated the officials since the beginning of the run, they announced that the final standing would be ready for publication on Tuesday.

It was a delightful affair from start to finish. Referee Ferguson was on the job every minute, formulating his rulings with refreshing promptness and keeping up to the minute with his tabulations. As a general thing, the score for each day's run was formed and posted ten minutes after the last car arrived, if it arrived within its schedule. If a contestant was late, Mr. Ferguson usually knew why long before the car arrived, and consequently there were none of the exasperating delays that have marked the administration of other tours. Arthur Newmeyer, starter; Mr. Hemstreet of the technical committee, and Francis J. Byrne, the official press representative, are deserving of special commendation for their work, as is also T. C. Willis,

the advance man who was belabored at times by all hands, but who performed his duties in a peculiarly effective and efficient manner, arranging for the entertainment of the party along the route. Everybody else who had any official connection with the party did his duty conscientiously and well.

There was no real kicking. Occasionally when a penalty was imposed the sufferer muttered a few things, but in a short time he realized that a tour of this kind is a battle and the unfortunates who fall because they choose to do a gallant deed or through accident where the other fellow is to blame, are just as dead as those who are shot down for running away.

There was a spirit of do or die that characterized the driving of all the cars. Not that it was reckless or foolhardy, but each driver seemed to have resolved upon setting out that he would take his car through without penalty if possible—but he would take her through.

Speaking of the drivers of the contesting cars, the following incident was amusing and illuminative. When the cars drew into Bethlehem, N. H., and the tired drivers and crews alighted and were being assigned to rooms in the Sinclair House, a New York butter and egg operator who is said to be close to the front in that line edged up to the representative of THE AUTOMOBILE and said:

"I see a dozen fellows among those drivers who have exceptional faces; clean-cut brows and firm chins. They show in their appearance that they have the possibilities of taking and holding much higher positions than the mere driving of automobiles. I should say that all of those men there (indicating a group of the drivers) might become first-rate butter and egg salesmen if they showed a willingness to work hard."

The men included in the group pointed out by the butter and egg man were: A. G. Carter, of the Carter Motor Car Company, who had three machines in the tour; Leo Shaab, president of the L. H. Shaab Auto Distributing Company of Baltimore; I. W. Dill, of the Inter-State Automobile Company of Harrisburg; W. S. Mercer, a director of the Great Western Automobile Company of Peru, Ind., and Charles E. Miller, of Charles E. Miller & Brother.

Each of the gentlemen mentioned probably could school himself to sell butter and eggs successfully if he found that selling and making of automobiles was not so profitable as the other line of industry.

All of which shows that keen observation and the ability to pick out real successful men is not lacking among the Summer visitors.

After the technical committee had finished its searching labors at the official garage in Washington, which continued over three days, not a single clean score remained among the contesting division of the Munsey Tour.

Not that the cars were wrecked by their long journey, for most of them could negotiate the route again without radical repairs, but it is hardly in reason to suppose that any automobile could go through such a test as was propounded to the cars of this tour without loosening bolts, sagging springs and other minor and unavoidable troubles.

The Maxwell touring car, No. 25, with a clean road score and penalized 3 points on final technical examination for the loss of a fan belt, was the winner of the sweepstakes prize. The car was driven with masterly skill and care throughout the contest and did not show a semblance of trouble until the committee got to work.

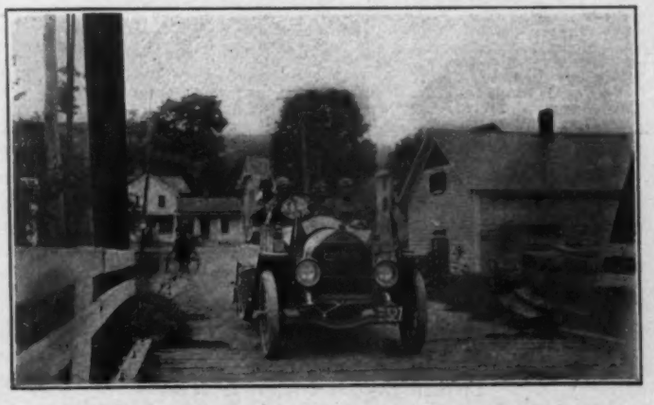
The winners in the various classes were: Brush 14, which had a perfect score on the road, but which was penalized 26 points by the committee; Ford 34, with a perfect road score and a technical penalty of 7 points; the Maxwell touring car as noted; the Washington roadster No. 6, which was penalized 12 points in the brake test and 8 points on final technical examination; the Stoddard-Dayton, No. 24, with a clean road score and a final penalty of 12 points and the Matheson 32, which was penalized 102 points on the brake test and 20 points on final technical.

Among the non-winners Brush 13, Ford 8 and Ford 30, Warren-

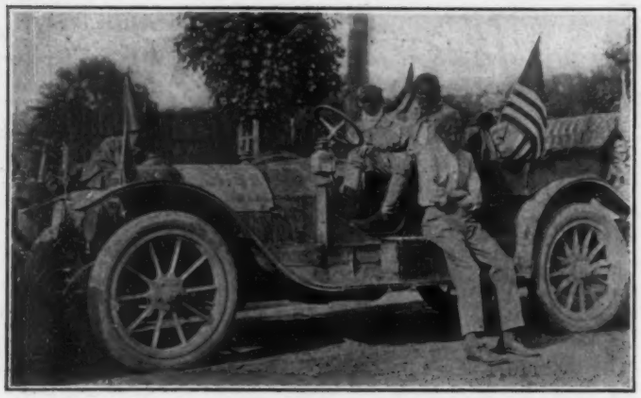
Staver-Chicago at Wilkes-Barre

Warren-Detroit went merrily along the road

Washington, near Harrisburg, performing splendidly



The cavalcade crossed the bridge at Otego, N. Y.



Matheson paused to be photographed for "The Automobile"

Regal, the "Plugger," makes light of sandy roads

Detroit 10, Washington 5, Enger 17, Corbin 11, Columbia 2. Cino 22, and Kline 31, only missed their classes by narrow margins.

No clutch, transmission nor motor trouble was discovered in any of the contestants by the technical committee, a remarkable showing. Several of the highly penalized cars deserve special mention. This is particularly true of Great Western 18 which was wrecked outside of noon control near Montpelier, Vt. La Mar, the driver of the car, was approaching an iron bridge when a woman suddenly turned into his course. Two paths lay open to him. He could either take a chance of injuring the woman or he could shoot his car into the iron girders and supports of the bridge. Like a good sportsman he chose the latter course and as a result his car was wrecked.

With his front axle in the shape of a letter S and with one wheel in fragments, the driver set to work to make repairs. A country blacksmith worked with the crew until after midnight and amid the cheers of those who knew the true facts in the case, the car joined the procession at the next control and finished the trip. Its penalty was 2284 demerits.

The Regal, which broke a spring in the last stages of the tour, had an unsmirched record up to that unfortunate moment. The

FINAL SCORES OF CONTESTANTS IN MUNSEY RUN
Division 1A—$800 and under

No. Car	Road Pen.	Final Examination: Brakes	Clutch	Trans.	Motor	Fin. Technic.	Total
14—Brush	0	0	0	0	0	26	26
13—Brush	3	0	0	0	0	30	33
19—Krit	1000—withdrawn as contestant						
Division 2A—From $801 to $1,200							
34—Ford	0	0	0	0	0	7	7
8—Ford	0	6	0	0	0	29	35
30—Ford	8	1	0	0	0	27	33
Division 3A—From $1,201 to $1,600							
25—Maxwell	0	0	0	0	0	3	3
10—Warren-Detroit	15	0	0	0	0	4	19
32—Moon	3	29	0	0	0	168	200
23—Staver-Chicago	242	0	0	0	0	7	249
27—Crawford	867	7	0	0	0	17	891
15—Regal Plugger	1000—withdrawn as contestant						
26—Maxwell	1000—withdrawn as contestant						
18—Great Western	2229	38	0	0	0	17	2284
Division 4A—From $1,601 to $2,000							
6—Washington	0	12	0	0	0	8	20
5—Washington	0	2	0	0	0	24	26
17—Enger	0	32	0	0	0	20	52
21—Ohio	71	15	0	0	0	17	103
29—Inter-State	111	7	0	0	0	13	131
16—Pierce-Racine	42	0	0	0	0	106	148
Division 5A—From $2,001 to $3,000							
24—Stoddard-Dayton	0	0	0	0	0	12	12
11—Corbin	0	11	0	0	0	5	16
2—Columbia	0	14	0	0	0	26	40
22—Cino	0	39	0	0	0	7	46
31—Kline	0	21	0	0	0	29	50
28—Glide	1000—withdrawn as contestant						
Division 6A—From $3,001 to $4,000							
32—Matheson	0	102	0	0	0	20	122

Pierce-Racine going up one of the hills at Wilkes-Barre

unspeakable chuck-holes of the Pennsylvania highways were the cause. Why in the ordinary course of human events anybody should wish ever to ride over such roads in a motor car is inexplicable. The wonder is not that the Regal broke a spring, but that the more fortunate contestants did not do so.

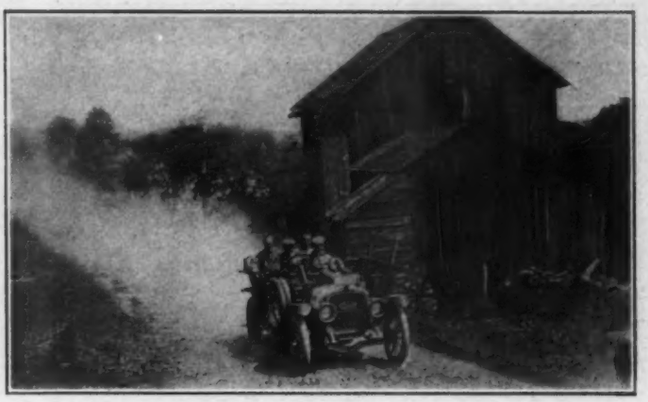
The K-R-I-T and Maxwell runabout, which were withdrawn on account of mishaps, one on account of a broken wheel and the other as the result of a broken bearing which caused a lot of trouble, finished the tour with a dash that belied the fact that they were declared out of the contest.

The Inter-State entry suffered the worst luck of the tour. But for the presence of a handfull of scrap metal in its gear case at the outset of the journey, the record of this car proves that it would have been tied with the winner of its class for the cup and the chances are that the difficulty experienced by this car at the start may have had some effect upon the brake and final technical penalties imposed. Of course, an entry in a great contest should be inspected with exceeding care before the flag falls, but the entrants of the car were generally accorded warm sympathy for the strange mishap that cost them a more prominent place in the final result.

The Moon, Staver-Chicago and Crawford entries received considerable penalties of one kind and another, the Moon breaking a spring leaf, the Staver experiencing trouble with a bearing and the Crawford having similar but more serious trouble. All three finished in style despite the vicious Pennsylvania and Maryland roads.

The Matheson had real tough luck. The car had run along with perfect score until turning for home, when, after following the pacemaker and starter on a wrong trail which led to a hillside road covered with rolling gravel, there was some error in signaling and the Matheson, when within three car lengths of the official cars, was forced to put on brakes. The rolling gravel would not hold the car and despite everything that could be done the car struck the Ohio roadster occupied by the starter and

Stoddard-Dayton scampered along the road at Wilkes-Barre



Corbin, just beyond Saratoga, on the State road

Selden leading across the bridge at the Susquehanna

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After crossing into Maryland, a very different story is to be told. Going into Frederick, for miles the roads are conducted as toll-roads. Where they are not criminally neglected, they are so filled with big water breaks that riding with any comfort, at a greater speed than ten miles an hour, is preposterous. It takes a lot of nerve to charge real money for the privilege of riding over such disgraceful highways, but the word was passed around that running a toll-gate in Maryland was practically a capital offense, and the keepers of the gates added to the impression.

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The big white Lozier with its white-garbed driver and mechanic made a great impression upon the 75,000 spectators by the steadiness of its running. With the regularity of an express train and at a speed fully as great, lap after lap was made with great consistency. The fastest circuit was the twenty-second, in 7:54, while the slowest was the twenty-fifth, when the watches showed 9:46. This included the time occupied at the pit in taking on supplies. The Lozier was not pushed during the latter portion of the race and Mulford played safe. He had a lap and a half at the finish over the National, the Illinois trophy winner.

Besides the four cars that finished, there started in the big race at 10 o'clock this morning a Black Crow, driven by Stinson; a Marmon, with Harroun at the wheel; an Alco, driven by Grant; a Simplex, with Saynor up; a Kissel-kar, with Harry Endicott in the seat; the Dawson-Marmon; the Matheson, handled by Basle; the Knox, with Oldfield driving, and Schiefler's Jackson—surely a most brilliant field. Undoubtedly had it not been for accidents early in the race the contest would have resulted in the greatest road battle ever fought on American highways. The Alco's career was brought to an end by a twisted clutch which put it out of the race at a time when its chances looked bright.

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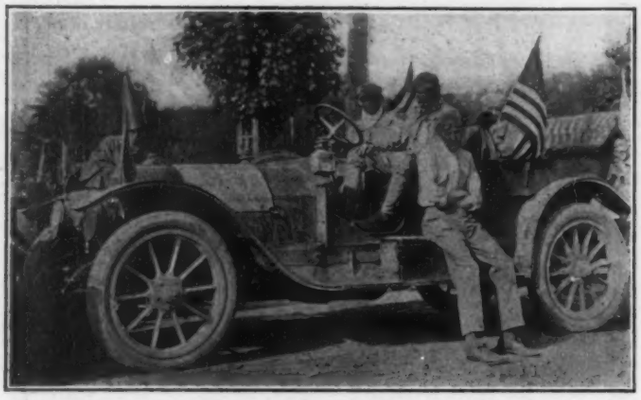

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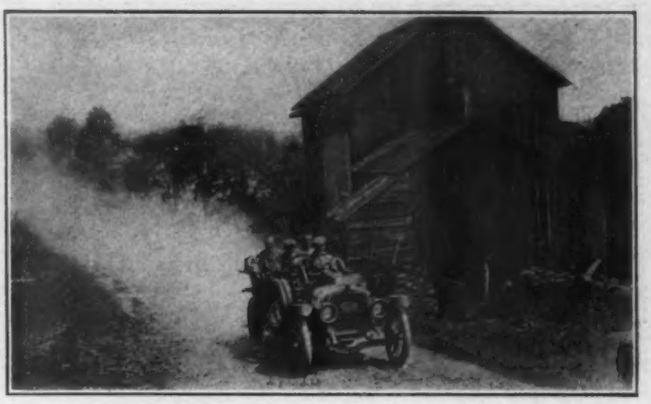

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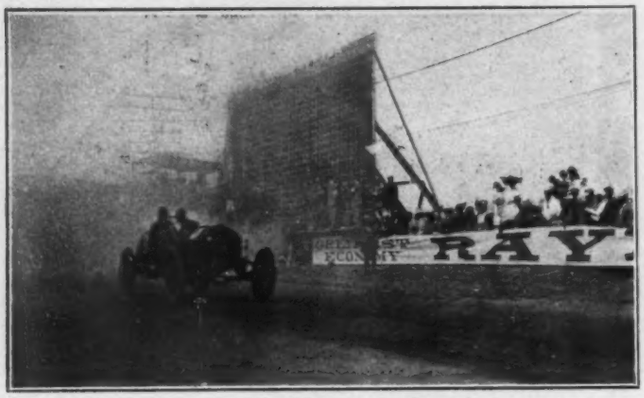
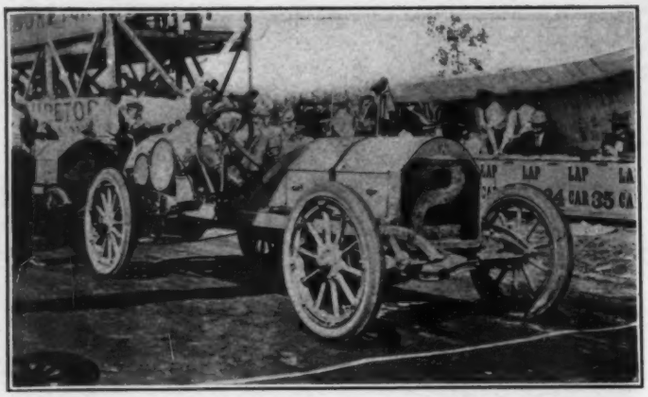
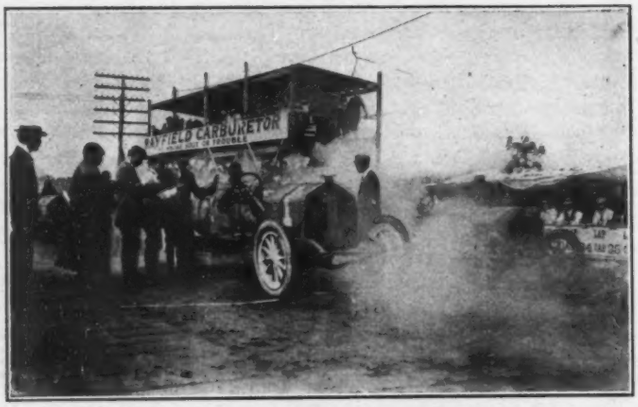


Lozier winning the Elgin trophy



Falcar lined up at the tape



National, a great performer and winner, at the tape

National No. 1 Wins the Illinois Trophy

No. 1 National, a demonstrating car entered by the Chicago agents and converted into a racer by stripping it of the body, yesterday won the Illinois trophy for cars of from 301-450 cubic inches piston displacement and removed all doubts as to the speed of the Elgin course. The winner averaged 60.6 miles per hour for 203 miles and went the entire distance without a single stop, its large fuel capacity enabling it to hold out to the end, while its tires went through without a mishap. From the outset the National never left the result in doubt, leading from start to finish and at times showing some remarkable bursts of speed. Second to the National was No. 2 Falcar, which averaged 57.2 for the distance, while third was No. 6 Marmon, which made 56.9 miles per hour. There were just 4 seconds difference between third and fourth, the Midland having the advantage over No. 7

KANE COUNTY TROPHY FOR CARS FROM

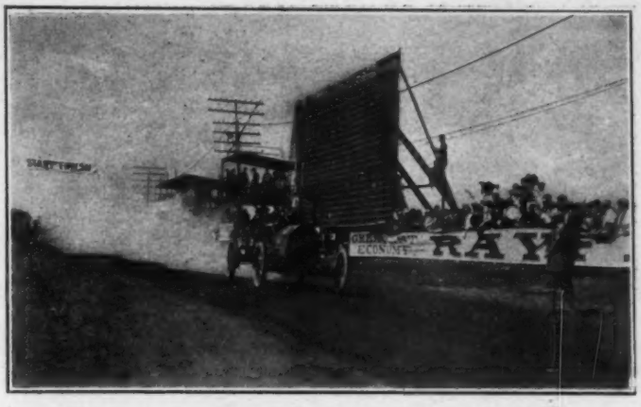
Car and Driver	Laps—	1	2	3	4	5	6	7	8	9
MARMON	Elap. Time	10:24	19:20	27:52	36:29	45:14	53:57	62:42	71:56	81:15
D. Buck	Lap Time	10:24	8:56	8:32	8:37	8:45	8:43	8:45	9:14	9:19
MARION	Elap. Time	9:27	18:36	27:38	36:41	45:46	54:51	63:52	72:50	82:04
A. Monsen	Lap Time	9:27	9:09	9:02	9:03	9:05	9:05	9:01	8:58	9:14
MARMON	Elap. Time	10:11	18:53	27:35	36:24	45:10	54:34	63:51	73:14	82:36
L. Heinemann	Lap Time	10:11	8:40	8:42	8:49	8:46	9:24	9:17	9:23	9:22
OVERLAND	Elap. Time	11:12	22:24	33:30	44:30	55:18	65:58	77:20	89:36	99:57
A. Schillo	Lap Time	11:12	11:12	11:06	11:00	10:48	10:40	11:22	12:16	10:21
CORBIN	Elap. Time	8:39	25:06	33:35	42:24	50:57	67:15	76:03	84:53	97:46
J. Matson	Lap Time	8:39	16:27	8:29	8:49	8:33	16:18	8:48	8:50	12:53
KISSELKAR	Elap. Time	10:24	20:48	30:40	40:34	50:18	60:02	69:52	79:47	
G. Schoeneck	Lap Time	10:24	10:24	9:52	9:54	9:44	9:44	9:50	9:55	
CINO	Elap. Time	9:44								
W. Fritzschke	Lap Time	9:44								

ILLINOIS TROPHY FOR CARS OF FROM 301 TO 450 CUBIC INCHES DISPLACEMENT

Car and Driver	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
NATIONAL	8:14	16:06	24:00	31:55	39:52	47:58	55:58	64:03	72:14	80:20	88:30	96:34	104:55	113:02	121:58	130:43	139:31	148:26	156:49	165:12	174:37
A. Livingstone	8:14	7:52	7:54	7:55	7:57	8:06	8:00	8:05	8:11	8:06	8:10	8:04	8.21	8:07	8:56	8:45	8:48	8:55	8:23	8:23	9:25
FALCAR	11:43	20:10	28:41	37:11	45:31	53:59	62:58	71:10	79:54	90:38	99:29	108:42	117:37	126:12	134:40	143:12	151:40	160:05	168:36	177:13	185:51
W. H. Pearce	11:43	8:27	8:31	8:30	8:20	8:28	8:59	8:12	8:44	10:44	8:51	9:13	8:55	8:36	8:28	8:32	8:28	8:25	8:31	8:37	8:38
MARMON	16:15	24:42	33:03	41:13	49:19	57:47	65:53	73:59	82:00	90:03	98:09	106:29	116:23	124:58	133:27	141:54	150:16	162:25	170:55	179:08	190:10
J. Dawson	16:15	8:27	8:21	8:10	8:06	8:28	8:06	8:06	8:01	8:03	8:06	8:20	9:54	8:35	8:29	8:27	8:22	12:09	8:30	8:13	11:02
NATIONAL	8:44	17:34	26:33	35:19	44:18	53:24	62:24	71:23	79:58	90:10	98:27	120:13	130:52	139:06	147:22	155:40	163:57	172:13	180:36	188:57	197:23
A. W. Greiner	8:44	8:50	8:59	8:46	8:59	9:06	9:00	8:59	8:35	10:12	8:17	21:46	10:39	8:14	8:16	8:18	8:17	8:16	8:23	8:21	8:28
MIDLAND	9:15	18:19	27:37	36:52	46:08	55:24	64:37	73:48	83:00	92:16	101:25	110:28	119:33	128:38	137:43	146:52	157:09	166:34	175:48	185:11	194:34
R. Ireland	9:15	9:04	9:18	9:15	9:16	9:16	9:13	9:11	9:12	9:16	9:09	9:03	9:05	9:05	9:05	9:09	10:17	9:25	9:14	9:23	9:23
FALCAR	9:10	18:05	27:09	36:03	44:52	53:52	63:20	72:12	81:03	89:46	98:35	107:21	130:52	139:36	148:23	157:07	165:05	179:22	204:21	213:11	221:59
J. F. Gelnaw	9:10	8:55	9:04	8:54	8:49	9:00	9:28	8:52	8:51	8:43	8:49	8:46	23:31	8:44	8:47	8:44	8:43	13:32	24:59	8:50	8:48
LEXINGTON	11:29	23:29	34:46	45:53	56:59	68:03	79:07	90:05	101:01	111:55	122:58	133:55	144:57	156:01	167:01	178:03	195:00	201:53	212:54	224:00	
R. Drach	11:29	11:30	11:17	11:07	11:06	11:04	11:04	9:58	10:56	10:54	11:03	10:57	11:02	11:04	11:00	11:02	12:47	11:03	11:01	11:06	
KISSELKAR	9:57	19:44	29:34	39:02	49:15	58:59	68:34	77:59	87:28	96:46	Radiator trouble.										
H. Endicott	9:57	9:47	9:50	9:28	10:13	9:44	9:35	9:25	9:29	9:18											

ELGIN NATIONAL TROPHY FOR CARS

Car and Driver	Laps—	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LOZIER	Elapsed time	8:18	16:18	24:18	32:25	40:37	48:44	56:53	64:57	73:03	81:09	89:10	97:10	105:05	113:04	121:07
R. Mulford	Lap time	8:18	8:00	8:00	8:07	8:12	8:07	8:09	8:04	8:06	8:06	8:01	8:00	7:55	7:59	8:03
NATIONAL	Elapsed time	8:24	16:26	24:28	32:36	42:09	50:23	58:24	66:19	74:27	82:29	90:32	98:35	106:45	114:53	123:07
A. Livingstone	Lap time	8:24	8:03	8:02	7:58	9:43	8:14	8:01	7:55	8:08	8:02	8:03	8:03	8:10	8:08	8:14
NATIONAL	Elapsed time	8:26	16:32	24:38	33:01	42:50	51:23	61:07	69:17	77:37	85:56	94:13	102:30	111:00	119:19	127:45
A. W. Greiner	Lap time	8:26	8:06	8:06	8:23	9:49	8:33	9:44	8:10	8:20	8:19	8:17	8:17	8:30	8:19	8:26
SIMPLEX	Elapsed time	8:20	16:26	24:33	32:36	40:41	48:44	56:51	64:55	73:00	89:21	97:36	109:23	117:45	129:52	138:03
G. Robertson	Lap time	8:20	8:06	8:07	8:03	8:05	8:03	8:07	8:04	8:05	16:21	8:15	11:47	8:22	12:07	8:11
SIMPLEX	Elapsed time	13:57	22:51	32:01	46:25	56:15	66:28	79:51	91:13	110:10	120:03	129:29	138:54	148:46	158:00	168:02
H. Saynor	Lap time	13:57	8:54	9:10	14:24	9:50	10:13	13:23	11:22	18:57	9:53	9:26	9:25	9:52	9:14	10:02
KNOX	Elapsed time	8:32	20:37	28:40	37:18	46:00	57:41	69:05	82:49	93:44	103:35	112:34	121:25	130:04	143:00	151:50
B. Oldfield	Lap time	8:32	12:05	8:03	8:38	8:42	11:41	11:24	13:44	9:55	9:51	8:59	8:51	8:39	12:56	8:50
MARMON	Elapsed time	8:51	17:21	25:50	34:21	42:50	51:16	59:43	68:10	76:37	85:04	93:29	101:45	110:05	118:29	126:45
J. Dawson	Lap time	8:51	8:30	8:29	8:31	8:29	8:16	8:27	8:27	8:27	8:27	8:25	8:16	8:20	8:24	8:16
BLACK CROW	Elapsed time	9:55	19:32	29:01	40:13	49:38	59:08	68:40	88:26	97:58	108:50	124:03	133:50	142:44	153:29	163:15
C. Stinson	Lap time	9:55	9:37	9:40	11:02	9:25	9:30	9:32	19:46	9:32	10:52	15:13	9:42	8:54	11:25	10:46
JACKSON	Elapsed time	9:00	20:09	31:40	40:24	53:42	62:19	70:50	79:25	88:01	96:27	105:00	113:32	122:03		
E. Schiefler	Lap time	9:00	11:09	11:31	8:44	13:18	8:37	8:31	8:35	8:36	8:26	8:33	8:32	8:31		
MATHESON	Elapsed time	8:48	17:20	25:54	34:34	43:11	51:58	60:44	69:48	78:09	87:24	95:50	Broken wheel.			
C. Basle	Lap time	8:48	8.32	8:34	8:40	8:37	8:47	8:46	9:04	8:21	9:15	8:26				
KISSELKAR	Elapsed time	9:38	18:49	28:07	37:23	46:41	55:58	65:03	76:23	85:52	94:56	133:58	Broken radiator.			
H. Endicott	Lap time	9:38	9:11	9:18	9:16	9:18	9:17	9:05	11:20	9:29	9:04	38:57				
ALCO	Elapsed time	8:12	Twisted clutch.													
H. Grant	Lap time	8:12														
MARMON	Elapsed time	8:48	Frozen piston.													
R. Harroun	Lap time	8:48														



Marmon cutting away from the tape in a mad dash

Winning Benz in the foreground just before the battle

National, the former car averaging 54.7 and the latter 54.6.

The race attracted a field of eight starters, of which five finished, while two of the others were running when the flags dropped for the final time. Only one car was put out of commission, that being the KisselKar, which went out after the tenth round because of radiator trouble. Besides the cars mentioned the other starters were No. 4 Falcar and No. 8 Lexington.

From the outset the two Nationals started to make a runaway of it, and for a time it looked as if they would accomplish their purpose. No. 7, being the first away, started to beat it from the beginning, and while No. 1 kept as close as possible it never was really dangerous after No. 7 had put in its four remarkably fast laps in the second, third, fourth and fifth rounds, in which it was clocked in 7:52, 7:54, 7:55 and 7:57.

Alco, No. 6, in foreground; No. 8 Simplex behind

231 TO 300 CUBIC INCHES DISPLACEMENT

10	11	12	13	14	15	16	17	18	19	20
90:11	99:04	115:11	125:05	133:33	141:57	150:36	159:09	167:30	175:57	184:45.79
8:56	8:53	16:07	9:54	8:28	8:24	8:39	8:33	8:21	8:27	8:48
91:06	123:10	112:26	121:51	130:44	139:58	149:13	158:29	169:32	178:38	187:52.65
9:02	12:04	9:16	9:25	8:53	9:14	9:15	9:16	11:03	9:06	9:14
91:22	114:22	126:17	137:23	146:05	154:39	163:10	172:42	181:20	190:16	199:20.27
8:46	23:00	11:55	11:06	8:42	8:34	8:31	9:32	8:38	8:56	9:04
110:00	120:32	131:00	142:16	156:53	167:18	177:54	188:37	199:05	209:40	220:04.15
10:12	10:23	10:28	11:16	14:37	10:25	10:36	10:43	10:28	10:35	10:24

FOX RIVER TROPHY FOR CARS OF FROM 161 TO 230 CUBIC INCHES DISPLACEMENT

22	23	24	Car and Driver	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
183:20	192:22	201:08.53	BENZ	9:31	18:41	27:55	37:12	46:50	56:41	65:52	75:06	84:23	93:52	103:22	112:41	122:05	131:25	141:01	150:40
8:43	9:02	8:46.53	E. Hearne	9:31	9:10	9:14	9:17	9:38	9:51	9:11	9:14	9:17	9:27	9:30	9:19	9:24	9:20	9:36	9:39
194:26	202:58	211:19.22	WARREN-DETROIT	10:24	20:47	31:52	42:20	52:47	64:14	74:19	85:17	95:38	105:36	115:36	125:14	135:07	146:24	162:27	176:11.62
8:35	8:32	8:21.22	A. W. Miller	10:24	10:23	11:05	10:28	10:27	11:27	10:05	10:58	10:21	9:58	10:00	9:38	9:53	11:17	16:03	13:44
198:10	206:05	214:09.62	STAVER	10:59	37:36	46:48	56:45	66:35	76:27	87:55	98:53	108:32	118:17	129:04	140:53	150:06	160:51	171:05	181:05.57
8:00	7:55	8:04.62	G. Monckmeier	10:59	26:37	9:12	9:57	9:50	9:52	11:28	10:58	9:36	9:45	10:47	11:49	9:13	10:45	10:14	10:00
205:34	213:52	222:15.30	STAVER	10:34	20:52	31:18	41:43	52:09	62:43	73:18	83:33	93:56	104:22	114:32	128:39	139:48	150:10	160:40	
8:09	8:18	9:23.30	N. Crane	10:34	10:18	10:26	10:25	10:26	10:34	10:35	10:15	10:23	10:26	10:10	14:07	11:09	10:22	10:30	
204:03	213:12	222:30.10	COLE	10:22	20:10	29:43	39:26	49:10	58:47	68:19	78:02	87:38	97:17	106:57	116:40	126:19			
9:29	9:09	9:08.10	W. Endicott	10:22	9:48	9:33	9:43	9:44	9:37	9:32	9:43	9:36	9:39	9:40	9:43	9:39			
			STAVER	9:58	21:26	31:12	46:07	67:08											
			C. Cheney	9:58	11:28	9:46	14:55	21:01											

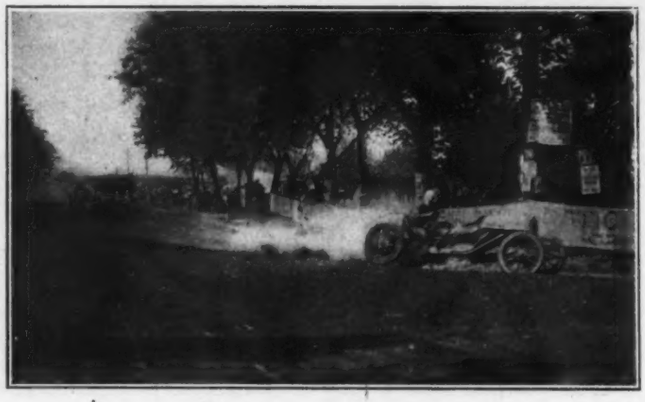
*Each lap measures 8 miles, 2499 feet.

UNDER 600 CUBIC INCHES DISPLACEMENT

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
129:08	137:09	145:09	153:10	161:09	169:05	176:59	184:55	193:13	202:59	211:05	219:14	227:24	235:29	243:31	251:40	259:47	268:01	276:16	284:24	292:29.84
8:01	8:01	8:00	8:01	7:59	7:56	7:54	7:56	8:18	9:46	8:06	8:09	8:10	8:05	8:03	8:09	8:07	8:14	8:15	8:08	8:05.84
131:39	140:06	148:24	156:37	169:19	177:43	186:00	194:15	202:24	210:33	218:47	227:05	235:26	243:55	252:28	260:59	269:39	278:10	286:50	295:32	304:10.90
8:32	8:27	8:18	8:13	12:42	8:24	8:17	8:15	8:09	8:09	8:14	8:18	8:21	8:29	8:33	8:31	8:33	8:38	8:40	8:42	8:38.90
136:12	144:35	153:01	161:30	169:52	178:12	186:21	197:05	205:25	213:48	222:42	231:20	240:02	249:00	257:56	266:54	275:50	284:46	293:54	303:24	313:23.30
8:27	8:23	8:26	8:29	8:22	8:20	8:09	10:44	8:20	8:23	8:53	8:38	8:42	8:58	8:56	8:58	8:56	8:56	9:08	8:30	8:59.30
146:08	159:34	167:47	179:14	187:28	198:53	207:02	215:01	223:00	230:57	239:10	252:30	260:46	268:52	276:49	285:46	298:26	306:53	315:02	324:04	332:20.78
8:05	13:26	8:13	11:27	8:14	11:25	8:09	7:59	7:59	7:57	8:13	13:20	8:16	8:06	7:57	8:57	12:43	8:24	8:09	9:02	8:16.98
177:27	186:39	196:02	205:24	214:32	224:16	233:44	243:12	252:50	262:16	271:48	281:27	293:10	303:40	312:07	321:49	Stopped				
9:25	9:12	9:23	9:22	9:08	9:44	9:28	9:28	9:38	9:26	9:32	9:39	11:47	9:30	9:24	9:42					
160:41	169:34	178:25	187:06	201:04	209:54	218:57	227:33	236:22	244:19	256:20	265:08	283:07	297:38	Engine trouble.						
8:51	8:53	8:51	8:41	13:58	8:50	9:03	8:36	8:49	7:57	12:01	8:48	17:59	14:01							
135:08	143:25	151:43	159:58	168:17	181:26	192:33	200:56	209:00	217:09	225:14	Broken frame.									
8:23	8:17	8:18	8:15	8:19	13:09	11:07	8:23	8:04	8:09	8:05										
173:31	189:26	199:48	222:01	237:17	247:38	257:57	Broken wheel.													
10:16	15:55	10:22	23:53	15:16	10:11	10:19														

Broken steering gear.

Cole, performing like a veteran, cutting in ahead



Staver-Chicago doing a turn like a whirlwind

Comparing the times of National No. 7 in the Illinois and the Lozier in the Elgin National, the tables show that the former went faster for twelve laps on Friday than did the latter in the big race to-day. There wasn't much difference, however, the National figures being 96:34, as against 97:10 for the Lozier. At the end of the fifteenth round the National still had the advantage by 52 seconds, but from this point on the Lozier had the advantage. A comparison of times of the two races for twenty-four laps, the distance of the Illinois cup event, shows thaf the National did 201:08.53 for his twenty-four laps, while the Lozier did 193:13.

Kane County Trophy Goes to the Marmon

Marmon No. 26 after a heart-breaking 169-mile race yesterday won the Kane County trophy event, in which seven cars of the 231-300 class competed. The Marmon's performance was a most noteworthy one, its average for the distance being 55.1 miles per hour. It won by a margin of 3 minutes 7 seconds over the Marion. The other Marmon, No. 23, was placed third and an Overland got fourth. The Marion averaged 54.2 miles per hour, Marmon No. 23 51.9 and the Overland 46.2.

The three cars that failed to go the distance were the Corbin, the KisselKar and the Cino, which met with mishaps before half the race had been run. The Corbin went nine laps before a broken frame caused its retirement; the KisselKar went eight and then pulled out because of a broken piston rod punching a hole in the crankcase, while on his second time around the Cino hit a telegraph pole at McQueen and was down and out.

The Cino accident was the first of the race. It had made a good getaway and at the end of the first lap was third to Corbin's first and the Marion's second. At the McQueen turn the Cino was running with two other cars, one of which was the Overland. These three were bunched approaching the turn and driver Fritzsch claimed he got the sign from the Overland mechanic to come ahead. But the Overland did not swing over, he asserts, and this left the Cino pilot the choice of going into the ditch or hitting the Overland. He chose the former, and hit a telegraph pole, bouncing from that into a barbed-wire fence. The Cino was so damaged in the mix-up that the radiator was put out of commission and it was declared out. The driver and his mechanic also were cut up some by the barbed wire, but neither was seriously injured.

The Kane County trophy race was the most interesting of the day from one viewpoint, that being the uncertainty that attended the running of the contest. It was no walkaway for any of them, five of the seven cars holding the lead at one time or other.

Fox River Trophy Goes to the Benz

With but one chance out of 34, Europe made good yesterday when a 30-horsepower Benz, a car of German manufacture, won the Fox River trophy which was offered in the small car race at 135 miles in which the eligibility line ranged from 161 to 230 cubic inches piston displacement. The Benz was the one foreign car entered in any one of the four events, and from the start it divided favoritism with the Cole. But the final results showed that for once the public had not sized up the situation properly for the Benz never left the result in doubt, leading from start to finish and beating the second car, a Warren-Detroit, by nearly 26 minutes. Of the six that started in the event only three finished, the Staver No. 36 sliding into third place. The Benz averaged 54.1 miles per hour for the distance, the Warren-Detroit did 46.1 and the Staver showed 44.9.

Originally there were eight cars entered in the event, but the weighing in yesterday afternoon resulted in the technical committee refusing to pass the two Fords, which had been entered by the Ford Motor Company. This decision was caused by the failure of the two cars to come up to the minimum weight of 1,400 pounds, which had been set for the 161-230 class. There was no question as to their eligibility as a stock car proposition, but No. 38 Ford hit the beam at 1,075 pounds, while the other Ford was even lighter, 950 pounds. Henry Ford positively refused to permit of bringing either one of his cars up to weight by the fitting of extra heavy seats, which might have enabled them to reach the coveted mark. Mr. Ford declaring that the Fords he had offered were stock cars and that it would be going directly against his principles of light-weight construction if he added extra weight in this manner. The decision of the technical committee was appealed by Thomas J. Hay, manager of the Chicago Ford branch, but the referee refused to reverse the technical committee's finding which ended the Ford incident.

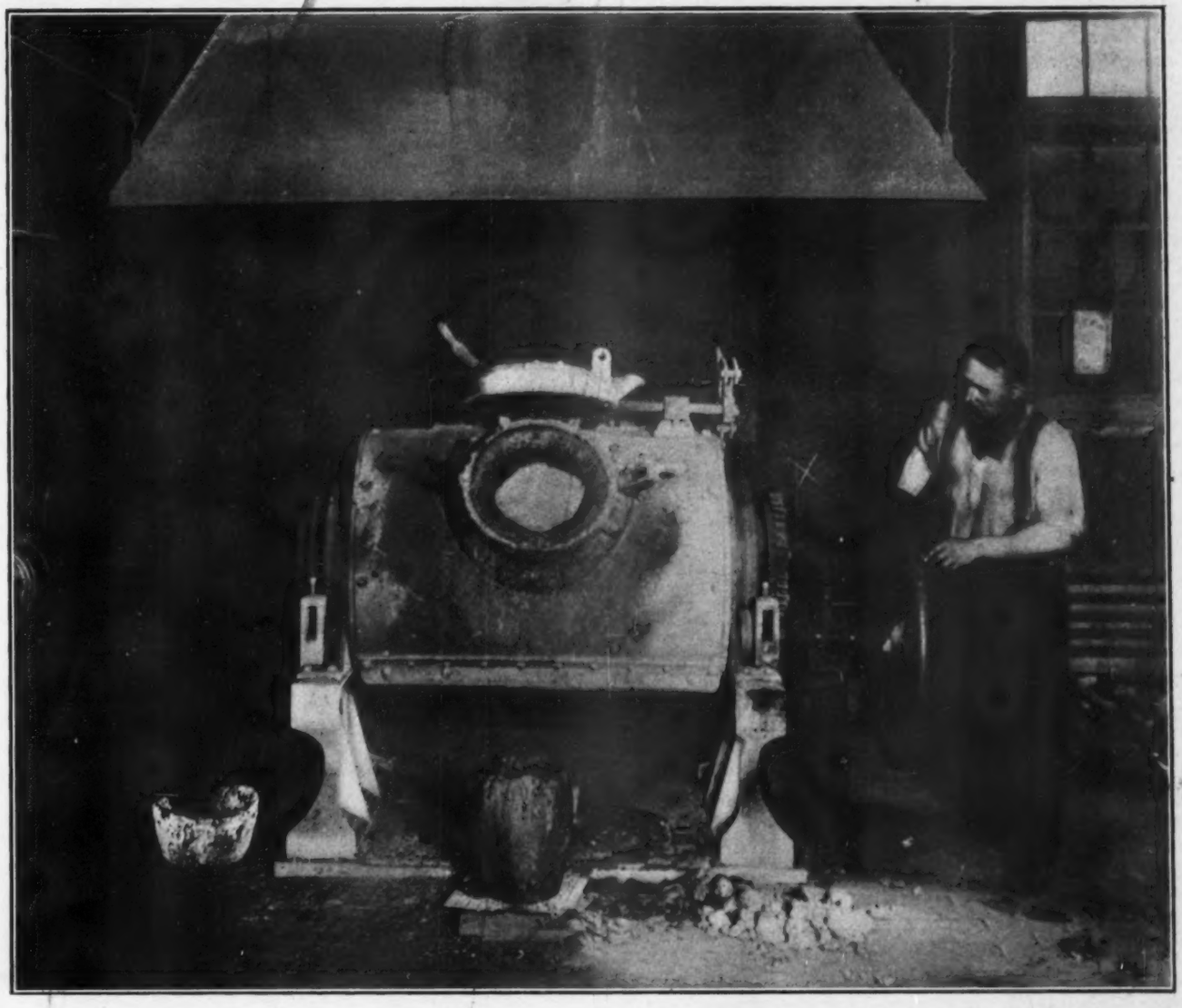
The Chicago Motor Club brought about an innovation in the starting of three races which were to be run simultaneously. Instead of starting the Fox River first, and then following with the other two, as if all three were in one field, the 301-450 class was sent away at 30-second intervals followed immediately after by the Kane County cars. Then there was an intermission of 20 minutes before No. 32 Staver in the Fox River got away. The idea in this was to have as many cars running at the finish as possible and thus add to the interest. The scheme worked out well and all three of these races came to an end at almost the same time.

The following table shows the fastest laps made in the various events:

Car	Driver	Time	H. P.	Race	Lap No.
National No. 7	Livingstone	7:52	64.5	Illinois	2
National No. 7	Livingstone	7:54	64.3	Illinois	3
Lozier	Mulford	7:54	64.3	Elgin	22
Lozier	Mulford	7:55	64.1	Elgin	13
Marmon	Dawson	7:55	64.1	Illinois	23
National No. 7	Livingstone	7:55	64.1	Illinois	4
National No. 7	Livingstone	7:55	64.1	Elgin	8
Lozier	Mulford	7:56	64.0	Elgin	21
Lozier	Mulford	7:56	64.0	Elgin	23
National No. 7	Livingstone	7:57	63.8	Illinois	5
Simplex No. 5	Robertson	7:57	63.8	Elgin	25
Simplex No. 5	Robertson	7:57	63.8	Elgin	30
Knox	Oldfield	7:57	63.8	Elgin	25
National No. 7	Livingstone	7:58	63.7	Elgin	4
Lozier	Mulford	7:59	63.6	Elgin	14
Lozier	Mulford	7:59	63.6	Elgin	20
Simplex No. 5	Robertson	7:59	63.6	Elgin	23
Simplex No. 5	Robertson	7:59	63.6	Elgin	24

Engineering Section

DEVOTED TO THE DISCUSSION OF ENGINEERING PHASES OF AUTOMOBILING, INCLUDING DESIGNING AND CONSTRUCTION FEATURES OF PRODUCTS, AND INFORMATION TO AUTOISTS



EXAMPLE OF ADVANCED FOUNDRY PRACTICE IN AUTOMOBILE PLANTS—TAKEN FROM THE MAXWELL

SIMPLICITY is worth more than every other feature combined, not only in an automobile, but in every other character of machine that has to be run by man. Confining this question to automobiles, there is more to be said for simplicity than there is when the same term is applied to a locomotive or a ship. The automobile is operated, for the most part, by men who know almost nothing about mechanical contrivances, nor is it possible for most of them to grasp the principles involved except in a vague sort of a way.

On account of the difficulty involved in getting the owners of automobiles to appreciate the things that they ought to know something about, and to eliminate the situations that can be of no great value, it is quite easy to foist upon the industry a considerable number of things that no longer adhere to the older arts. It is possible for men who know very little themselves to invent complication and find a ready market for it. But is it easy for the men who invent simplicity to make a living in this field? Supposing a man were to propose to show how it would be feasible to do without 1,000 of the 9,000 kinds of parts that are used in the average automobile, how much would he be able to sell the plan for? Nothing. Let some other man design a complication and offer it for sale; how many autoists are there who would refrain from trying it out? Very few.

In defining simplicity as it refers to automobile work, let us not be deceived; leaving off half of the essentials

will scarcely serve for the purpose; making a carbureter do half of the work that a carbureter is supposed to do is not the proper course; a carbureter, for illustration, is better able to do this work than a cylinder of a motor. In a word, confine the carbureter to its proper function; keep the cylinders doing their share, make the magneto do ignition work only. Be sure that the spark plugs are capable of holding up their end. Such is simplicity in automobile work.

Likewise, throughout an automobile, if the units and the components thereof are so designed that they will do the work for which they are intended, the chance of failure at any point will be much reduced. But if the magneto, for illustration, is defeated by spark plugs that are incapable of standing the wave of electromotive force that the magneto is capable of impressing the result is complication.

As an indication of the ills that follow complication of this sort, it is only necessary to point out that the motor will perform badly, if at all; the carbureter will apparently function badly, and the autoist, no matter how much experience he may have, will be much puzzled.

In trying to get out of trouble in the face of this complication, the autoist will soon have the car in a state of bad repair; the carbureter will be out of adjustment; the magneto will be out of time, and the whole situation will be in just the state that a doctor finds a man when he is troubled with several disorders, no one of which will respond to treatment—impoverished blood is the real disorder.

As another instance of the definition of simplicity, some designers prefer to make one bolt do two things; other designers use a bolt for one purpose only. Which is the nearer to right from the point of view of simplicity? Certainly one bolt doing two jobs disposes of a part. On the other hand, is it in the interest of simplicity? When an owner of a car finds that repairing is necessary, is he so likely to understand a complicated situation, and is it not true that the mechanism is complicated when one bolt is used to hold two parts in place? Does it not assume the proportions of a mechanical puzzle? The repairman receives a certain amount of money per hour for his time. Is he likely to take more time solving a mechanical puzzle than he will occupy if he merely removes two bolts instead of one? When one bolt is placed to do two kinds of work it is possible that it may be subjected to two kinds of stresses, and the strength of the bolt may not be equal to the occasion. At all events, when this question of simplicity is solved, it will take into account all of these matters, and it is quite possible that the end will be different from that which the average man pictures in his mind.

Safe Handling of Gasoline

TELLING OF THE DANGERS, AND ILLUSTRATING SOME OF THE METHODS THAT ARE EMPLOYED AS SANCTIONED BY LIBERAL EXPERIENCE.

Fig 2—Filter used on Bowser gasoline storage tanks

UTILITY, as it resides in the automobile as a mode of transportation, depends quite as much upon the fuel available as it does upon the excellence of the mechanism. If, then, the fuel must be taken advantage of, certainly it must be stored in sufficient quantity to enable one to draw upon the supply as the occasion requires, without at the same time feeling that it is a source of too great responsibility to have it in hand in quantity sufficient to represent a fire hazard. It may not be generally appreciated, but even coal, when it is stored, must be carefully provided for to keep it from becoming ignited; spontaneous combustion is likely to set in unless it is properly ventilated.

The list of fuels available in the world include coal, wood, peat, hydrocarbons (in liquid form), alcohol, composite mixtures (made up of hydrocarbons, alcohol, nitrate of ammonia, picric acid, acetone, benzol, etc.), and if the matter is carried to its final conclusion, nitro-glycerine, gun-cotton, gunpowder and other explosives may be placed in the category of fuel.

Glancing at the fuel situation with a view to a further and more intimate acquaintance with it leads up to the question of the real dangers involved in the manipulation of the various grades and generic types of the same. Energy, of which there is a fixed amount in the universe according to the present belief, may be classified, referring to its various places of abode, as follows:

(a) Energy of position, that is to say, the energy that is stored in a mass, as a brick in an elevated position on the wall of a building, or a rocking boulder in the highest peak of a far-off mountain.
(b) Muscular energy of animals.
(c) Energy of the wind.
(d) Energy of vegetation.
(e) Energy of water.
(f) Energy of coal.
(g) Energy of liquid fuel.
(h) Energy of fuel in gas form.
(i) Energy of explosives.
(j) Chemical energy.
(k) Electrical energy.
(l) Energy of the sun's rays.
(m) Energy of impact.
(n) Energy of recoil.

What is energy? Briefly, it is a capacity for doing work.

What is work? It is the overcoming of resistance through distance. Another way to define work is to say, it is the product of moving force into distance.

When energy is expended work must be done; time is taken to do the work. The difference between energy and work, then, is the difference between the capacity for doing work and the doing of it. All energy that is not active resides in static form, as energy of position; that is to say, the energy is potential, ready to be freed, when, in time, it will perform work.

The energy as it resides in the various classes of fuel is measured in heat units and it has a mechanical equivalent.

Remembering that the measure of energy called the heat unit is the amount of heat that will raise the temperature of one pound of water one degree Fahrenheit (taking pure water at the point of its maximum density), it is a further step in the right direction to also remember that Joule's equivalent, the mechanical

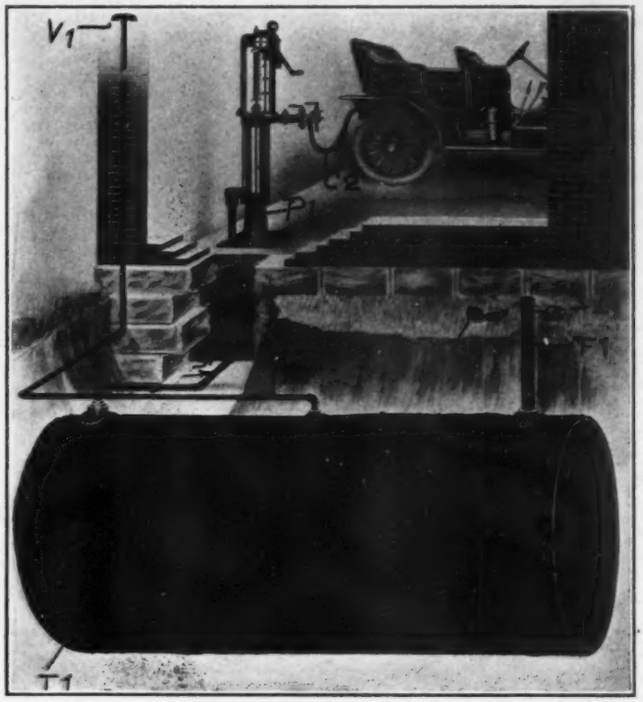


Fig. 1—Illustrating the most approved method of placing a storage tank of steel under ground near a garage

equivalent of heat, is equal to 142.4 foot-pounds. From this point on it is easy to frame a measure for power, as horsepower, so called, since it is stated that 33,000 foot-pounds equal one horsepower.

The Great Point of Difference to Remember

In the further discussion of the fuel problem, if it is the aim to properly differentiate, account must be taken of the time required to convert the energy that resides in the several generic types of fuel into useful work. The difference between the use of nitro-glycerine and coal, as a fuel, is largely in the difference in time required to abstract the energy from the respective forms. It takes quite a little time to abstract energy from coal; it requires but an instant to wring the energy out of nitro-glycerine.

Let us look into one other phase of this problem before striking the main road of the discussion. The most commercial way to abstract energy from coal is to burn it. The best way to burn coal is to set it on fire in the presence of enough oxygen to form carbonic acid and water. There are substantially 14,000 heat units in a pound of good coal; the energy may be abstracted from the same if the coal is completely burned in the presence of enough atmospheric air to supply the requisite amount of oxygen. The reason why the energy cannot be abstracted from coal as quickly as it can be from nitro-glycerine is because the oxygen of the air cannot be quickly combined with the carbon and hydrogen in the coal. The reason why nitro-glycerine gives up its energy so quickly is because the oxygen is combined in the mixture in more acceptable form, or the ingredients for freeing oxygen in the process of burning are in a better position than when atmospheric air is relied upon as the storehouse of the necessary oxygen.

As an illustration of what happens when explosives are not properly contrived, it is only necessary to remember that ordinary black powder, as used in blasting, etc., is far from smokeless; the smoke is due to incomplete combustion, the amount of oxygen present in acceptable form being less than that which would be required for complete combustion.

To sum up, remembering that time is an important factor when energy is displayed in the process of doing work, coal is better for fuel under a steam boiler than nitro-glycerine, because it burns fast enough to accomplish the commercial purpose of its being, whereas nitro-glycerine would introduce a monstrous hazard, and eliminate the germ of commercialism—disaster would be the normal expectation instead. When it is desired to destroy, as in war, nitro-glycerine and other explosives are preferred, the reasons being sufficiently clear to render further elucidation futile.

But if coal is too slow-burning to serve for purposes of war, and explosives are too vigorous to work advantageously under a steam boiler, it follows that in other walks, as when internal-combustion motors are to be used to furnish the power for automobiles, some other form of matter holding energy may be a better selection.

The internal-combustion motor has no need for a boiler because the fuel is burned directly in the presence of the mechanism that translates the energy. Any residuum, as ash, would clog up the machinery, and coal would deliver an abundance of ash. Liquid fuel, while it is composed of over 83 per cent. carbon (a form of coal), seems to be suitable for the purpose for two reasons, *i.e.* (a) the residuum, as ash, is relatively a mere trace, and (b) the fuel is more acceptable from the point of view of the combining of the requisite amount of oxygen to burn the fuel to complete combustion.

It is in the hydrocarbon series of fuels that reliance is placed, for the present, as fuel for automobile motors, referring to just the hydrocarbon compounds that are normal as liquid, but of which it may be said, the volatility is relatively high. Some hydrocarbons are normal in gas form, others may be found in solid form. Let it be understood right here, that all the hydrocarbons, before they will suitably mingle with oxygen of the air, must be vaporized; that is to say, they must be changed in their state of aggregation from solid and liquid forms to the gas form; even in the gas form, before they will burn, they must be combined with oxygen.

These hydrocarbons differ from all forms of explosives to the extent that they do not hold in their make-up the quantity of oxygen necessary to support combustion; indeed, there is very little oxygen in the hydrocarbons that survive in liquid form.

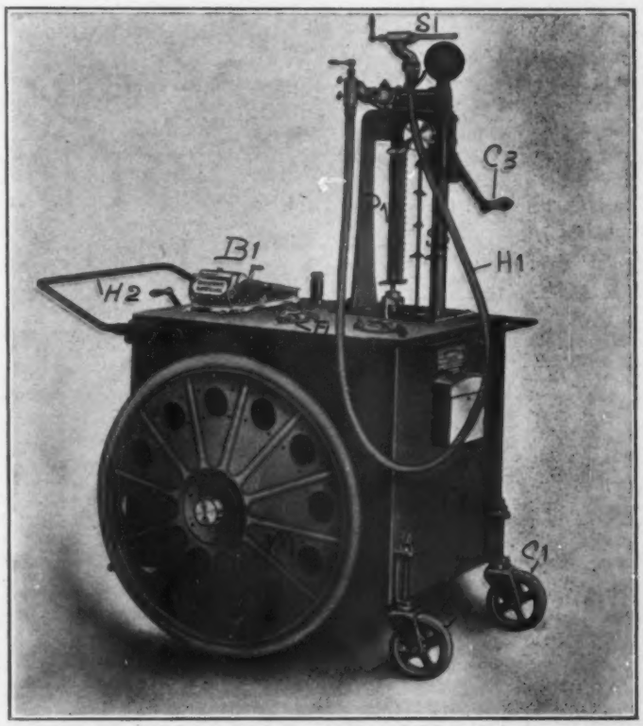


Fig. 2—Garage portable tank and pump, with facilities for noting and keeping track of the gasoline taken out of the tank

The most acceptable form of liquid fuel, then, may be regarded as holding qualities as follows:

(A) It should hold the maximum possible amount of energy in it per pound.

(B) The specific gravity of the fuel should be as high as possible in order that the amount of room that will be taken by it per thousand heat units will be low.

(C) It should be so volatile that it will vaporize within the available time.

(D) The boiling point (temperature of ebullition) should be as near the temperature of the surrounding atmosphere as possible.

(E) It should be capable of abstracting its oxygen from the air, nor should the compression or temperature have to be beyond that which is readily procured by simple mechanisms.

(F) It should deliver up its energy so readily that it will make for efficiency under normal working conditions.

(G) It should not, under any circumstances, deliver up its energy faster than the same can be disposed of safely.

Automobile gasoline answers to this description to a marked degree.

The Problem of Proper Storage Remains

Knowing all the requirements of the fuel and having one that responds to the needs, all that remains is to learn how to store and keep the same. Perishable substances, as eggs, beef and gun-cotton, must be stored in such a way as to preserve them. The fact that eatables will spoil if they are not properly kept is well appreciated; it is worth noting that gun-cotton will also spoil if it is not properly stored; but when it does spoil, unlike beef, it explodes.

Unless automobile gasoline is properly stored, it, too, will spoil, but, unlike gun-cotton, it will not explode. Instead of becoming more explosive as the result of spoiling in storage, automobile gasoline becomes less so, and in one sense this is a fortunate circumstance.

The only thing that can happen to automobile gasoline if it is not properly stored is that it will fail to serve for its purpose.

Of course, if automobile gasoline is allowed to leak out of storage and mingle in the atmosphere in the right proportion, it will, in the presence of a flame, burn. The force of this quick release of so much energy is enough to set fire to the surroundings and do quite a little damage of one sort or another.

Being sufficiently volatile for the purpose for which it is stored and ultimately used, it must be locked up much more securely than water for illustration. Extremely volatile hydrocarbons will penetrate the pores of a glass bottle; automobile gasoline holds in its make-up very little of the extremely volatile constitutent; but it is composed of a series of distillates, some of which are sufficiently volatile to penetrate the walls of a poor storage tank. To keep the gasoline intact it is necessary to provide a tank the walls of which are so dense that the more volatile portion of the fuel will remain, and in this way the autoist is assured of the fact that the fuel will not deteriorate while on storage, and he will also abort the chance of a fire.

How This Process Is Worked Out in Practice

If an autoist wants to run his car with the greatest measure of economy, the first thing to consider is the purchase of the fuel in packages large enough to afford to him the lowest price that can be negotiated.

(*Continued on page 377.*)

Letters

ANSWERS TO INQUIRIES WHICH WILL THROW SOME LIGHT ON THE METHOD OF DETERMINING THE SPECIFIC GRAVITY OF GASOLINE; REMAGNETIZING PERMANENT MAGNETS; THE REFRIGERATING EFFECT OF GASOLINE; THE USE OF MANOGRAPH CARDS, ETC.

Might as Well Determine S. G. of Peaches and Pears

Editor THE AUTOMOBILE:

[2,347]—I have been told that the specific gravity method of determining the quality of gasoline is not now used; please tell me why. I am sure that there are others who would like to know more about this matter. Permit me to say that I have learned a great deal about the fuel problem in THE AUTOMOBILE. It is to be hoped that you will continue the effort that you are making.

Grand Rapids, Mich. P. E. F.

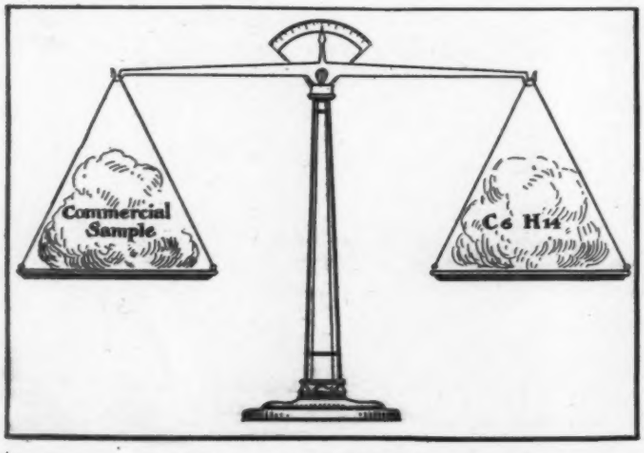


Fig. 1—Illustrating the weighing of true gasoline in comparison with automobile gasoline

When gasoline proper was being sold and used, which was several years ago, the specific gravity method of determining as to the general suitability of the fuel was satisfactory. Gasoline

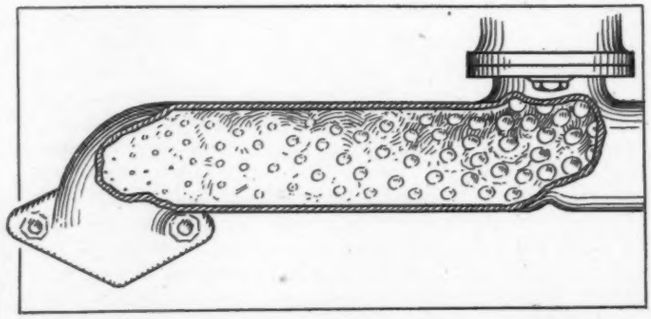


Fig. 2—Indicating the formation of globules of automobile gasoline in the intake manifold of a motor

at that time was a close distillate lying between chymogene and benzine C. As it is at present the composition of automobile gasoline (which is not gasoline technically speaking) includes chymogene, benzine C, benzine B and benzine A, with, perhaps, a little kerosene. Hydrometers are used to determine the specific gravity of some one fluid, but it is obvious that such instruments are incapable of determining the specific gravity of an aggregation of fluids. Just to help the understanding, refer to the balance as indicated in Fig. 1; the pan at the right is filled with hexane (C_6H_{14}), which is the principal constituent of true gasoline; the pan at the left is filled with proportions of pentane, hexane, heptane and octane, with, perhaps, nonane and decane. Supposing

the scales do balance, the volume of liquid may not then be the same in each of the pans, and what is equally to the point the fuel value of the two fluids would not be the same. True, the thermal value of hexane is not very different from the same value of the other constituents, but the other (less volatile) distillates would not be in such acceptable form as hexane, that is so readily burned to carbonic acid and water.

Refrigerating Effect of Gasoline Is the Cause

Editor THE AUTOMOBILE:

[2,348]—Why is it that the manifold on the intake side of my motor frosts up for a considerable distance from the carbureter? At times the carbureter also shows this same difficulty, if such it might be called. I will be glad to have you state in what way this frosting trouble interferes with the motor performance. Is there any way to overcome it?

Chicago, Ill. L. S. CHILDS.

When gasoline is changed from a liquid to a gas the volume of the gas is very much greater than the volume of the liquid for a given weight. Expansion takes place, and in expanding the gasoline gives about as much heat as is represented by the heat of compression. Ammonia, in the anhydrous state, is used for refrigerating work on account of the great change in temperature that takes place when the liquid is expanded to form ammonia gas. Gasoline is not nearly as good a refrigerating medium as ammonia, but it possesses enough of this property to do what you claim happens in your case.

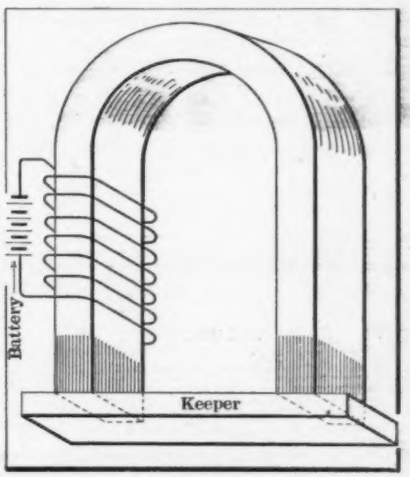


Fig. 4—Showing how permanent magnets are remagnetized

Remembering that the latent heat of evaporation must be overcome when gasoline is evaporated, which latent heat is equal to about the amount of heat that is required to raise 8 ounces of water 1 degree Fahrenheit, it remains to supply this heat before the liquid will evaporate. If it is not supplied at a sufficiently rapid rate the temperature will be lowered, and, as in your case, the temperature falls to that of the frosting point.

What really takes place is: Globules of liquid gasoline pass up into the manifold as shown in Fig. 2, and the heat necessary for the vaporization of these globules of liquid must pass from the manifold to the liquid; it does not transfer at a rate sufficient to satisfy the thermal conditions with the result that the temperature lowers.

One way to overcome this trouble, for such it is, is represented in Fig. 3, which is a cross-section of the float bowl of a carbureter. In this example the surfaces around the bowl are waterjacketed and it is the idea to circulate hot water in this jacket for the purpose of helping to supply the heat necessary to overcome the latent heat of evaporation of the liquid.

There are material objections to this plan; the heat should be supplied to the liquid as it oozes out of the nozzle, which is the point of vantage. The reason why it may not be the best plan to heat the liquid is that it may boil in the bowl, in which event the "steam" (vapor of gasoline) will rush out through the vent hole of the float bowl, and besides representing a considerable loss of fuel, it is likely to add to the fire hazard.

The remaining two ways to supply heat to the liquid are: (a) By heating the air as it enters the depression chamber of the carbureter and (b) waterjacket the carbureter around the depression chamber; the depression chamber of a carbureter is the space in which the nozzle is housed.

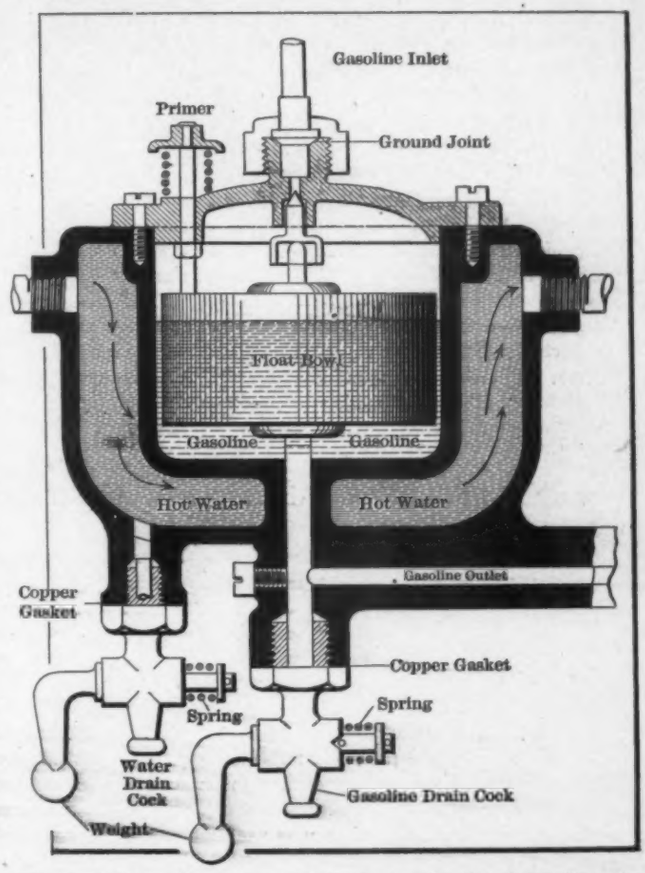


Fig. 3—Section of the float bowl of a carbureter indicating the water jacket placed for the purpose of supplying heat

Wants to Remagnetize Permanent Magnets

Editor THE AUTOMOBILE:

[2,349]—I am convinced that the permanent magnets of my magneto are so demagnetized that they are not now suitable for the service that I should get out of them; can you tell me how to remagnetize them? I receive so much benefit from your "Letters" that I am loath to miss a single number of THE AUTOMOBILE.

South Bend, Ind. G. E. ALBERTS.

Referring to Fig. 4 of the permanent magnets of a magneto, it shows that the magnets are separated from the other parts

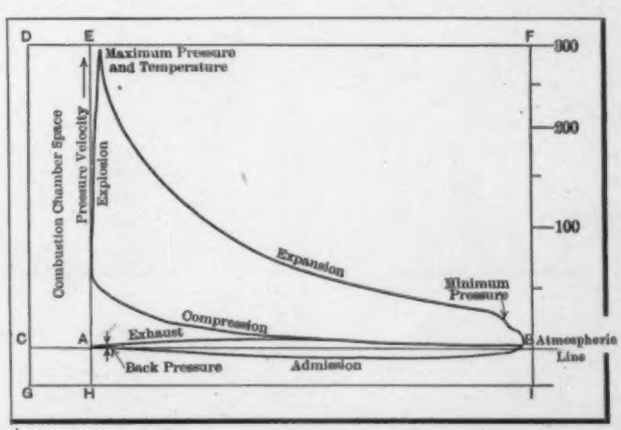


Fig. 5—Manograph card from a motor depicting the waves of pressure during the four cycles

(polar horns) of the magneto, and a few turns of insulated wire are wound around the metal above one of the extremities. A keeper of soft iron is also placed across the ends to complete the magnetic circuit. The two ends of the winding are connected to the terminals of a storage battery (the ignition battery, if it is of the storage type, will do) and the current is permitted to circulate in the windings (coil). The best way to accomplish the purpose is to allow the circuit to remain closed for, say, five minutes, regulating the flow by a variable resistance as a rheostat. In opening the circuit the current should be allowed to die out; after the operation is completed it will be proper to let the magnets rest for a few hours and then give a second dose of the charging current, repeating the performance as in the first place. If this charging process is repeated several times the magnets will become more saturated than if it is done only once, but even one charge will bring them up to probably 80 per cent. of the maximum possible charge that they are capable of holding.

Wants to Know More About Manograph Cards

Editor THE AUTOMOBILE:

[2,350]—A friend of mine, who seems to know quite a little about automobile motors, tells me that the manograph card is of the greatest value in determining how well a motor is performing. I am fairly well acquainted with indicator cards as they are used in steam-engine work and what I want to know is, what is the difference between a manograph card and an indicator card as it is taken on an indicator of the regular type?

Dundee, Ill. READER.

The manograph, like the indicator, traces the pressures in the cylinder of the motor. The indicator, on account of inertia of parts, lost motion and the lack of responsiveness of the spring, fails to do accurate work when it is used in high-speed gasoline motor work, and the manograph is used in preference. The reason why the manograph is more suited to the work is due to the fact that a beam of light is utilized photographically to trace the line of pressure, thus eliminating the necessity of using a spring and a stylus or other equivalent as a pencil in a finger-like arrangement. Fig. 5 is a reproduction of a card taken by a manograph, in which the cyclic relations are clearly shown. The suction stroke is represented by the "admission" line, the compression stroke is indicated by the "compression" line, ignition takes place during the dwell of the piston at the top end of the stroke and is here represented by the "explosion" line. The power stroke is depicted by the expansion line, exhaust beginning at the point marked minimum pressure, *i. e.*, showing the terminal pressure. This card is not shown for the purpose of pointing out how good it is; indeed, it is not a good one. Were a motor to perform as depicted on this card the volumetric efficiency would be very low and the back pressure would be far too high. If the volumetric efficiency of a motor is low it is assured that the power will be below the requirement and the thermal result will be poor. In reading the cards taken by a manograph it is necessary to be fairly well acquainted with the characteristics of motors, and, while there is quite a difference between steam practice in this regard as compared with the best practice in internal-combustion motor work, the fact remains that there is a certain need for "horse sense" in both cases.

The Company Will No Doubt Make the Change

Editor THE AUTOMOBILE:

[2,351]—I have been a reader of THE AUTOMOBILE for five years and would like an answer to the following question: I have a 1907 machine equipped with make-and-break Bosch low-tension magneto. I would like to change this to the new Bosch magnetic plug, using the same Bosch low-tension magneto and distribute the spark to the magnetic plug with a timer. Could this be done with success?

Allentown, Pa. CHARLES W. GRAMMES.

Questions That Arise

CONCERNING THE LIMITED USE OF THE METRIC SYSTEM BY AMERICAN BUILDERS; EMPLOYING MAGNETOS FOR LIGHTING; PERTINENT POINTS ABOUT VALVES

[215]—What is the reason why the metric system is so little used by American builders of automobiles?

There are many reasons. To begin with, the metric system is not an American idea. This has more bearing upon the subject than might be supposed, The metric system has much in its favor, but that fact has no bearing upon the quality of automobiles, whether they be made according to English or metric measurements. If a workman is trained into thinking in English, so to speak, it is highly improbable that he can drop that habit and take up with a new one without making quite a number of mistakes. But even if he does not commit errors he will, at least, be compelled to go slow.

The potential force of habit is well recognized. If a man becomes accustomed to indulging in strong drink, or if he has a penchant for opium, it is a well-recognized fact that he is booked for life. A very few men have sufficient strength of character or bias of mind to shake off such habits and conduct themselves normally. The force of habit is just the same, whether or not the habit is that of eating opium, drinking rum, or measuring parts on a 24-inch gauge.

That the English method of measuring is thoroughly good in every practical way is shown by the excellence of the work that is done under its sway. The real English unit of measurement in the shops that are devoted to the building of automobiles is the thousandth of an inch, and fractions of this unit are taken on a decimal basis. True, there are a great number of persons who labor under the impression that a carpenter's rule is used in sizing the parts of automobiles, but they would undertake a considerable contract in telling how artisans would be enabled to locate an error of 0.0002 of an inch in the diameter of a ball, for instance, by any such method.

The great complaint that is made about the English system of measuring is that it is not provided with a scientific foundation. These critics point out that the metric system has a scientific basis for its being. Ancestry is to be lauded; practice makes perfect. In the meantime what is the significance of the respective foundations for linear measurements to the man who wields the rule? The authorized standards of the two foundations of linear measurement are as follows:

The International standard meter is derived from the Metre des Archives and its length is defined as the distance between two lines at 0 degree Centigrade.

In the English system (which is the same as the United States standard) the Troughton scale is the standard.

This information is all that the machinist would be able to procure as a practical statement of the facts, and in the long run he would be compelled to go to a maker of measuring instruments and purchase one that he would be able to use.

From the cost point of view, there are many other reasons why makers should go slow about adopting new standards of measurement. Take the centering of gears in a transmission system; if noise is to be aborted the centers between the prime and lay shafts must be true within 0.0005 inch. This accuracy is assured, not by depending upon artisans to scale closely, but by the

use of gigs; is it the use of any system of measurement that governs this? No. The distance is fixed by the pair of gears used. The number and pitch of the teeth of the pair of gears disposes of this matter.

The inter-relation of the members in the make-up of the automobile are fixed independently of the system of measurement for the most part, and it is highly improbable that such matters can be readily shifted. Men must be permitted to speak the language that they understand, or they will fail to grasp the situations that confront them. There are other reasons why the metric system is not being rapidly absorbed in this country, but they have been exploited from time to time and at great length in some of the cases.

[216]—Is it not possible to employ magnetos for lighting as well as for ignition work?

Barely possible. It must be remembered, however, that the magnetic field of a system of permanent magnets is very weak as compared with the magnet field that is afforded when the magnets are of soft iron and wire-wound. The electromotive force generated by an armature rotating in a magnetic field is determined as follows:

$$Va = \frac{Ia \times sa \times \Phi}{10^8} = \text{electromotive force impressed on the armature windings.}$$

$$Ia = \frac{10^8 \times Va}{sa \times \Phi} = \text{number of the inductors wound on the armature.}$$

$$\Phi = \frac{10^8 \times Va}{sa \times Ia} = \text{total flux of the magnetic force emanating from one pole of the magnet.}$$

$$sa = \frac{10^8 \times Va}{Ia \times \Phi} = \text{speed of the armature in revolutions per second.}$$

It will be seen that the voltage depends upon the total flux emanating from one pole, all other things fixed, and this property of permanent magnets is relatively very low. It is, of course, possible to increase the speed to a certain extent, but even this choice is limited, partly on account of possible mechanical trouble. and to quite some extent on account of heat losses; they increase materially with speed due to hysteresis and Focault currents, quite apart from bearing trouble and the effects of centrifugal force.

[217]—Is it not possible to increase the diameter of the rotor and in this way add to the ability of the magneto to deliver enough current to supply the lamps as well as the ignition system?

No. Increasing the diameter of the armature does not add to the ability of the permanent magnets. The peripheral velocity of the armature can not be increased beyond a certain point in any case, and this velocity can be obtained with a small diameter rotor running at a high rotative speed just as well as it can with a large diameter rotor, which would have to be run at a lower rotative speed.

[218]—Would it not be possible to add to the number of turns of wire on the rotor and in this way make up for the lack of strength of the permanent magnets?

No. The internal losses would increase so much as to reduce the output of the armature to a point too low to serve for the stated purpose. The question of commercial efficiency, so called, is not a point worthy of serious consideration, it being the case that the total power required is so low as not to introduce a serious loss. The point is that the armature would have an internal loss so great, in proportion to the output, that it would probably be destroyed by heat.

[219]—What is the lift of valves in well-made motors?

About 8 millimeters.

[220]—Is it good practice to make the lift of both inlet and exhaust valves the same?

Very likely.

[221]—Do some designers make a distinction between inlet and exhaust valves in this regard?

Yes. The Mercedes, in one type of motor, established a lift of 8 mm. for exhaust and 7 1-2 mm. for inlet valves.

[222]—What is the most prolific cause of knocking in a motor, assuming that the bearings are properly taken up and the mechanism proper is in reasonably good working order?

Every other knock would have to be of a thermic character. If it may be assumed that there is not a growth of carbon it still remains to observe if there is a projecting fin or a pocket of some character in which carbon may settle and insulate the metal from the cooling influence of the water in the jacket.

Columbia Is Ready

MARK 85 IS THE LATEST FROM THIS PLANT; VESTIBULE TYPE OF BODY IS A DISTINGUISHING FEATURE; ALL MODELS REFINED AND AMPLIFIED

IN connection with the announcement of its 1911 models it is interesting to note that the Columbia Motor Car Company has incorporated therein not a few refinements and several novel features, as has been its custom in each of the sixteen years it has been engaged in the building of automobiles. For the coming season two gasoline cars are announced. The well-known Mark 48, which first saw the light in 1905, is continued, with some refinements and a few changes, but will be known as "Mark 48, Lot 5." In addition, there will be a new model, denominated as "Mark 85." It is with the latter that this article will more particularly deal.

Among the body designs offered in the Mark 85 are four- and six-passenger vestibuled roadsters, seven-passenger vestibuled touring car, limousine and landaulet bodies. The four-passenger roadster bodies practically follow the 1910 lines, with the fore-door feature that has emphasized the company's body designs for the past two years. The season's novelty along these lines, however, is the six-passenger vestibuled roadster—an original straight-line body, somewhat resembling the four-passenger vestibuled roadster, but longer, and provided with two extra seats. These seats may be removed, making a very attractive four-passenger roadster with added carrying space.

The seven-passenger touring body is also enclosed with vestibule door. The location of the doors and gear-shifting and brake levers does not necessitate an awkward leg movement in the operation of the foot pedals. The interior of all touring bodies has been taken advantage of to supply all seating and touring comforts. The door panels are fitted upon their inner faces with deep leather pockets, with small but secure locks.

One of the most appreciated features of the Mark 85 is the enclosure of the running-board brackets. Instead of having the sheet-metal work follow the conformation of step irons, this work extends outward from the top of the frame section to a point directly over the inner edge of the running board, which it drops to meet. Into this housing is built the tool box, and behind it is placed the Prest-o-Lite tank for the headlights, and auxiliary ignition battery, etc., thus giving the running board an absolutely clean and light appearance, and preserving the long lines of the car.

All bodies are of metal, reinforced with wood, and all open

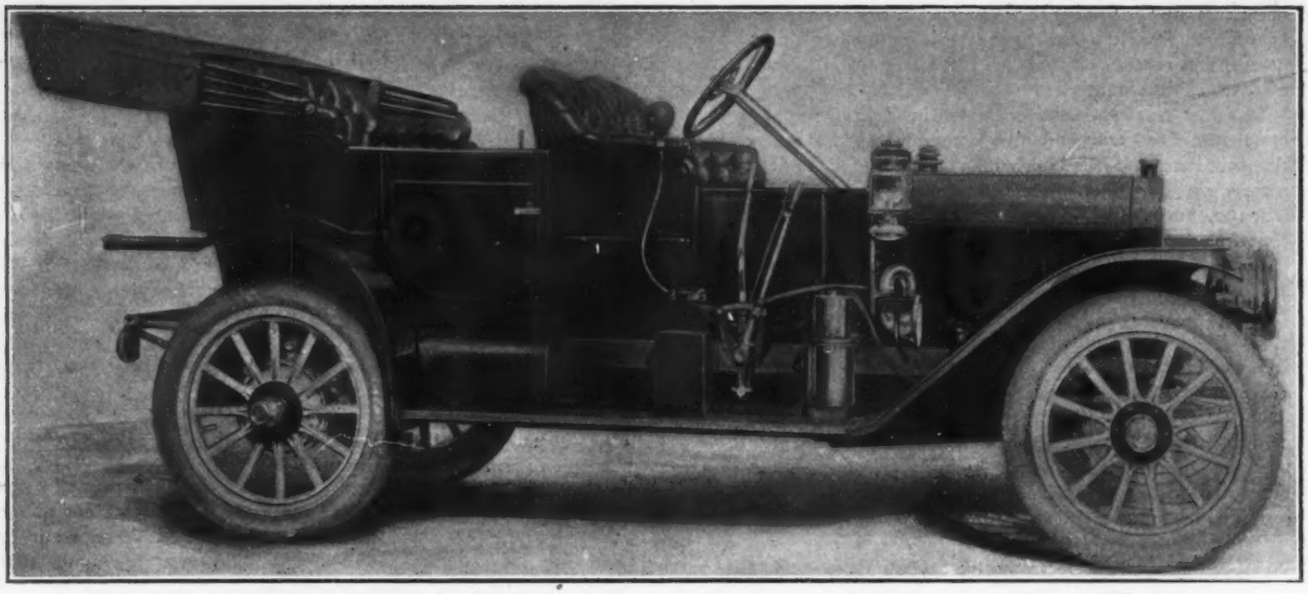


Fig. 1—Vestibule type of body that distinguishes the Columbia automobiles for 1911

bodies are trimmed with the best quality of hand-buffed leather with curled hair and coil spring upholstery, there being a wide choice allowed purchasers in upholstering and trimming of coach bodies. The front seats are individual. Mark 85 open bodies carry four, six or seven passengers, all the closed bodies being designed to carry seven. In Mark 48 the passenger capacity of closed-body designs is four, five and seven; closed bodies, five.

The motor of Mark 85 develops 35 horsepower, A. L. A. M. rating, that of Mark 48 being rated at 32.4. The former's wheelbase is 120 inches, as against 115 inches in the older model—the tread in all instances being 56 inches, with a road clearance of 11 inches.

Wood artillery wheels with forged-steel hubs feature all this year's models, demountable quick-detachable rims being included in Mark 85, and Universal quick-detachable in Mark 48. All brakes act on rear wheel drums, foot brakes being of the contracting, band type and the emergency of internal-expanding shoe type.

Four- and six-passenger open cars of the Mark 85 model are equipped with 36 x 4 tires, front and rear; seven-passenger open and closed cars, 36 x 4½ front and rear. Quick-detachable clincher tires are standard on all Mark 48 cars—four- and five-passenger, 34 x 4 front and rear; seven-passenger and closed bodies, 34 x 4 front, and 34 x 4½ rear are the standard tire dimensions.

There is a wide option in Mark 85 color schemes. In open cars: green body, gray gear; blue body, gray gear; green body, green gear; blue body, blue gear; Wedgwood green body and gear. Limousines and landaulets: green, blue or maroon. In Mark 48, Columbia blue body and cream gear or Columbia green body and cream gear are optional.

SPECIFICATIONS FOR COLUMBIA

MODELS	Price	H.P. A.L.A.M.	BODY		MOTOR				COOLING		IGNITION		Lubrication
			Type	Seats	Cyl.	Bore	Stroke	Cyl. Cast	Radiator	Pump	Magneto	Battery	
Mark 85.....	$3300	38	R'ster..	4	4	4⅞	5½	Pairs..	Cellular .	Cent'f'l..	Bosch...	Exide...	Pump..
Mark 85.....	3400	38	R'ster...	6	4	4⅞	5½	Pairs..	Cellular .	Cent'f'l...	Bosch...	Exide..	Pump..
Mark 85.....	3500	38	Tour'g..	7	4	4⅞	5½	Pairs..	Cellular..	Cent'f'l .	Bosch...	Exide...	Pump..
Mark 85.....	4800	38	Limous.	7	4	4⅞	5½	Pairs..	Cellular .	Cent'f'l...	Bosch...	Exide...	Pump..
Mark 85.....	4900	38	Land't..	7	4	4⅞	5½	Pairs..	Cellular .	Cent'f'l...	Bosch...	Exide...	Pump.
M. 48 Lot 5.....	2750	32.4	Tour'g..	5	4	4½	4 7/16	Pairs..	Cellular .	Cent'f'l...	Bosch...	Exide...	Splash .
M. 48 Lot 5.....	2750	32.4	R'ster*.	4	4	4½	4 7/16	Pairs..	Cellular..	Cent'f'l..	Bosch...	Exide...	Splash .

* Vestibuled

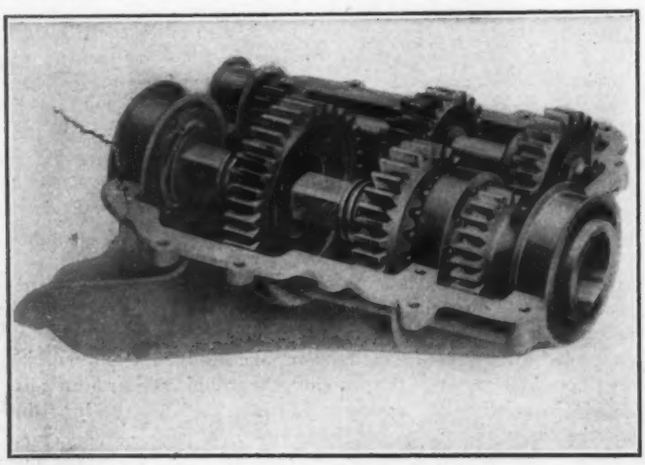


Fig. 2—Transmission gear of the Mark 85 car, showing short shafts, Hess-Bright ball bearings, and using fine materials

Principal Mechanical Features of the Mark 85

The motor is of the four-cylinder "T-head" type, with cylinders cast in pairs, having a bore of 4⅞ inches and stroke 5½ inches. The water jackets are cast integral with the cylinders. The valves are of large diameter, the intake and exhaust valves being on opposite sides of the motor, with large water circulation areas around the valve seats and valve stems. The design of the cylinders includes a polished plate top, which may be removed for inspection.

The ignition is the new Bosch double system, using eight plugs. There is an independent battery system and an independent magneto system. One or the other, or both systems in common may be used. In no way is this to be confounded with the previous Bosch dual system with two sources of supply and a single scheme of distribution. The new Bosch double system includes two absolutely independent sources of current and means of distribution.

The two systems are controlled from a single switch mounted upon the dash, which switch is operated by hand or foot, and a rotating barrel with stops for battery or magneto contacts or at a midway stop when all eight plugs are used in firing. The switch handle is fitted with a locking device and the switch cannot be removed from the "off" position without the key is properly inserted in the switch handle. This feature will make

the tampering with or unwarranted use of cars difficult of accomplishing if not absolutely impossible.

The crankshaft is of generous proportions, with large bearings and webs, and the connecting rods are drop forged. The engine bearings are of special-alloy white metal. The motor is suspended through four hollow square legs and through which extend standpipes, gauze covered, to provide for crankcase ventilation.

The lubrication plan includes a powerful gear pump of 15 pounds pressure capacity. This pump circulates oil from a reservoir in the crank case through a conduit cast within the middle section of the motor and from which there are diverse pipe leads to all bearings. The system includes a sight-feed indicator, located upon the dash, that the circulation of oil may be noted at all times. The front timing gears are included in the lubricating system, and there is poured from the top continually upon the engaging surfaces of these timing gears a powerful stream of oil. This oil, in falling, is strained and returned to the reservoir to be again forced through the main and secondary leads. This is a lubricating method used in previous Columbias, and in some few other high-powered cars.

Radiation and cooling are insured by a powerful centrifugal pump keeping water in continuous circulation. A modish cooler of ample size and fine design with high peak, behind which is located a belt-driven, ball-bearing and eccentrically mounted fan, cools the circulating water. The water connections are of spun brass and of graduated diameter to allow for even distribution.

The clutch is of the cone type. The facing, however, is a commercial packing, a product obtainable anywhere, and being an admixture of asbestos and other elements. This provides a clutch capable of finding and maintaining its own seat, and further, it is impossible to burn out. The clutching action, too, is arrived at through a powerful leverage, so that the clutch is easy of operation. The pedals are adjustable, suitable for any leg length, and are of the disappearing type, leaving a clear floor board.

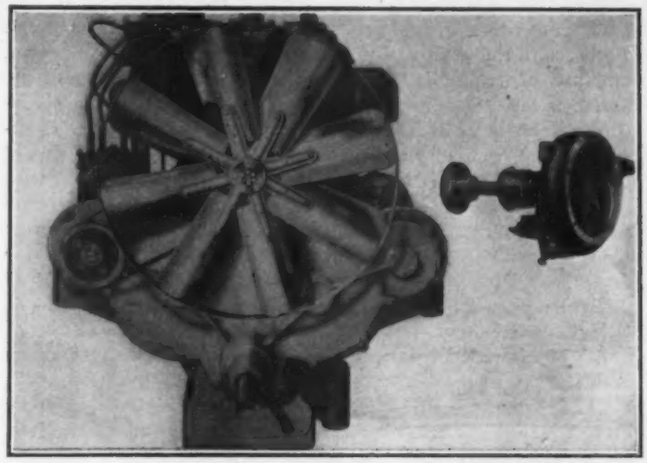


Fig. 3—Front end view of the Mark 85 motor, presenting a large fan and a neat appearance

The transmission is similar to those used in Columbia cars since 1903. In this transmission there is a very short length of shaft left unsupported. Both the main and secondary shafts are equipped with Hess-Bright ball bearings. Operation is through a selective grid iron gate by a single lever within the driver's easy reach.

The rear axle is of the full-floating type, with side torsion rods. The torsional strains of the axle are taken by the torsional bars, and there is no interference with the free action of the spring. The driving pinion is mounted within a cage upon short series Timken roller bearings, and is bodily removable, while the bevel gear is mounted directly to the differental housing, making a unit with this mechanism.

The live axles are of large diameter and extend through the wheel hubs and may be removed without raising the road wheels from the ground. The drive is accomplished through dove-tail hub flanges.

The frame is of pressed steel with a drop at the rear allowing for practically a straight-line drive, and the propeller shaft is

CARS AS OFFERED FOR 1911

Clutch	TRANSMISSION				Wheelbase	Tread	Frame	BEARINGS			Weight	TIRES	
	Type	Speeds	Location	Drive				Crankshaft	Transmis'n	Axle		Front	Rear
Cone....	Selecti'e.	3	Unit...	Shaft...	120	56	P. Steel..	Plain...	Ball....	Roller..	.....	36x4	36x4
Cone....	Selecti'e.	3	Unit...	Shaft...	120	56	P. Steel..	Plain...	Ball....	Roller...	.....	36x4	36x4
Cone....	Selecti'e.	3	Unit...	Shaft...	120	56	P. Steel..	Plain...	Ball....	Roller...	.....	36x4½	36x4½
Cone....	Selecti'e.	3	Unit...	Shaft...	120	56	P. Steel..	Plain...	Ball....	Roller...	.....	36x4½	36x4½
Cone....	Selecti'e.	3	Unit...	Shaft...	120	56	P. Steel..	Plain...	Ball....	Roller..	.....	36x4½	36x4½
Cone....	Selecti'e.	3	Sep. Un.	Shaft...	115	56	P. Steel..	Plain...	Ball....	Roller...	.....	34x4	34x4
Cone....	Selecti'e.	3	Sep. Un.	Shaft...	115	56	P. Steel..	Palin...	Ball....	Roller...	.....	34x4	34x4

Roadster

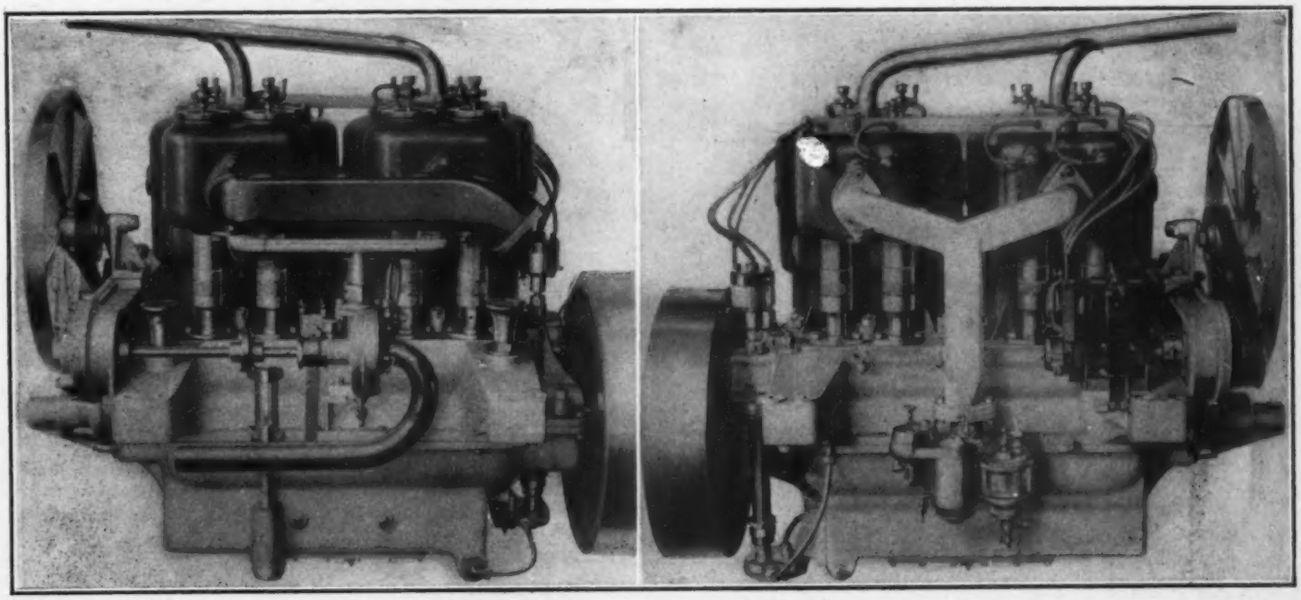


Fig. 4—Two views of the Mark 85 Columbia motor, showing the magneto and carburetor on the right-hand side and the water pump on the left

mounted in encased universal joints of ample capacity for the load, and which joints are subjected to practically no wear. Both front and rear springs are generous in number of leaves, and are of semi-elliptical type. These springs have been especially designed and selected for their resiliency and capability of accepting both light and heavy loads, thus adjusting themselves to all carried weights. The wheel hubs are drop forged and the front axle is a solid forging of I-beam type, and with integral spring seats. The steering gear is of the worm and sector type and irreversible, and is contained within an aluminum housing which is mounted directly upon the top of the side frame member.

The trimming of Mark 85 touring car and roadster is of hand-buffed black leather, while the limousine and landaulet are of green, blue or maroon broadcloth or leather. Mark 48 trimming is uniformly of hand-buffed black leather.

The equipment of Mark 85 cars is most complete. A spare carrying rim is included, so that tire changes may be easily made. The spare tire irons are fitted into the frame brackets and the fenders, which are new and without visor caps, and are strongly supported with dove-tail irons. Proper suspension and protection for springs is safeguarded with the inclusion of a full set of four shock absorbers. Bosch high-tension magneto and Exide storage sparking battery of six volts capacity are standard equipment, as is a Prest-o-Lite tank. There are two large and powerful gas headlights, and three oil-burning lamps on this car.

The side oil lights are mounted upon brackets forged integral with the dash irons, and the headlights are stayed against the possibility of vibration. The taillight is mounted out of the path of dust and where the lightrays fall directly upon the registration number. The solidly anchored trunk rack is large enough to accommodate large touring trunks. Foot-rest, robe rail and horn, are within easy reach of passengers and driver. A full complement of usual and special tools is contained within a leather-bound canvas roll, with leather strap and tie buckle. Beneath the rear seat is placed a tray so proportioned as to accommodate the top side curtains without breaking the celluloid windows. Muffler cut-out, operated with heel press, and connected with bell cranks and rods, is supplied with all cars, as is a storage locker of large carrying capacity. A plunger pump self-contained hand oiler of large capacity is located beneath the motor bonnet, and is spring held against the chance of falling.

The Columbia price proposition is sufficiently varied to appeal to all classes of buyers: Mark 85, four-passenger roadster, $3,300; six-passenger roadster, $3,400; seven-passenger touring, $3,500; seven-passenger limousine, $4,800; seven-passenger landaulet, $4,900. Mark 48, Lot 5, five-passenger touring, $2,750; four-passenger roadster (vestibuled body), $2,750.

New Continental Rim

NEW IDEA IN DEMOUNTABLE RIMS; A PLURALITY OF BAYONET JOINTS ARE TAKEN ADVANTAGE OF IN FASTENING THE TWO MEMBERS OF THE RIM; LIGHT CONSTRUCTION AND EASE OF OPERATION ARE DOMINANT FEATURES

EXPERIENCE teaches that road wheels are subjected to more abuse than any other part of an automobile, and the cost of road-wheel upkeep is higher than the cost of gasoline or even the wages of the chauffeur. This being so, it becomes necessary to examine into this situation at frequent intervals with the hope, perchance, that some way will be found for reducing the largest factor that influences for a high up-keep. Many autoists find that it is one thing to save up enough extra money to purchase an automobile, but if the car is kept in constant service after it is received the cost of road-wheel upkeep assumes proportions that merit attention. This is not a matter that should be complained of on the assumption that the cost is out of all bounds; the point is that the largest item is the one that should be worked upon with the expectation of reducing it if possible.

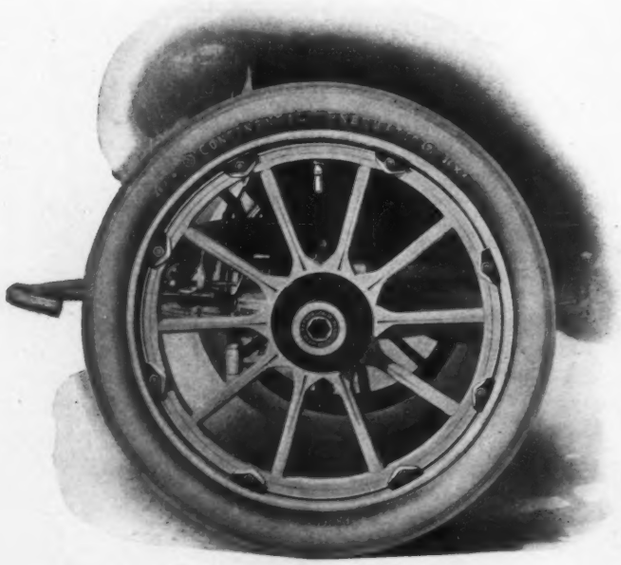


Fig. 1—Showing the work completed—ready to proceed

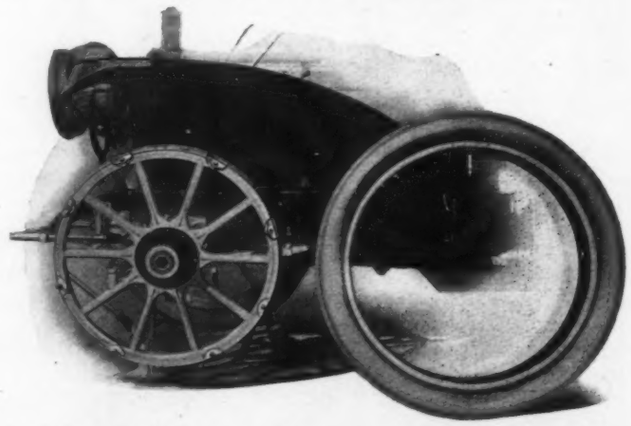


Fig. 2—The stripped wheel, with rim and tire ready for adjustment

This question of road-wheel upkeep has several angles; it is well understood, or it should be, at any rate, that tires will last over twice as long if they are removed and repaired promptly than they will if the little wounds are allowed to fester.

But the removal of tires is an undertaking that the average autoist does not take kindly to—the work is too hard. Under the circumstances the greatest stride in the direction of a low cost of upkeep is to provide rims that will save labor and coax the owner of the car to examine the tires at frequent intervals.

That tire-makers appreciate this phase of the situation must be manifest if account is taken of the strenuous efforts they are continually making to improve rims, it being the idea to so facilitate the work that tires may be removed and replaced with but slight effort, not only upon the road when a puncture has

to be coped with, but in the garage, with a view to reducing tire depreciation by the only known way, *i. e.*, keeping the wounds healed up so that mildew will not creep in and pursue its ravenous course.

The latest effort along advanced lines is being made by the Continental Caoutchouc Company, New York City. The new rim is here illustrated in various ways with a view to clearly depicting the plan of design, general construction and the proper method of use.

How the Rim is Made and Used

The character of the material used in the new Continental rim is of such high grade that it responds to the dies so readily as to make it possible to form a series of "bayonet" joints between the two members, as shown in Fig. 3. By this arrangement the two parts are joined or disjointed readily, and the security offered by this form of joint is adequate for the most exacting need in this service. When the parts are slipped into place, as a further inducement for security, a locking mechanism is set. With a view to showing how the locking is done reference may be had to Fig. 5, of the operation of placing the outer rim, and to Fig. 6, depicting the locking operation; this is also the position that the tire is placed in when it is desired to unlock the rim prior to removing the tire.

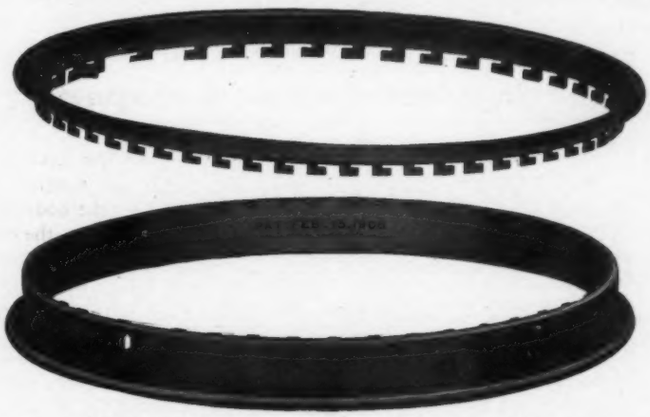


Fig. 3—Showing the rim and the series of bayonet joints between the two members

The wheel, with the new rim removed, is presented in Fig. 2, and the rim with the tire in place is stood up just in front of the stripped wheel. When the tire is placed in the rim the complete unit is slipped into place over the security rim on the felloe of the wheel, and when all is properly adjusted the locking operation is done in the manner as indicated in Fig. 4. The finished undertaking is pictured in Fig. 1.

The new product is known as the Gilbert type of "Detachable Demountable" rims, and among the points of advantage are numbered the fastening devices, utilizing the principle of the wedge, there being six fasteners, with specially contrived locking nuts, the latter being so designed that they cannot be detached from the wedge; hence the autoist, in making a repair on the road at night when it is dark, is not likely to have to make a fruitless search for missing nuts.

The method of securing the wedges is so nicely contrived that there is no tendency of the rim to "freeze," which is a character of trouble that has proved the undoing of many of the earlier efforts in this direction.

One other matter that has been cared for in this rim lies in the design, which is so contrived that the bolts are not subjected to bending moments; this is extremely important, it being true that the bolts would scarcely hold out against the force of continued service were they so placed that they would have to take the work as cantilevers.

In the matter of weight the design lends facility, and the material reduction in weight that the company has been enabled to make in this, over all its previous efforts, is to be commended.

Fig. 4—The final operation—locking the attaching device

The bayonet joint method of securing the two numbers of the rim is responsible for this particular improvement, due to the fact that strength is imparted by utilizing many such joints rather than to have accumulations of metal at a few points around the periphery. The rims are formed in dies, avoiding the necessity of making the mass of material enough for the purpose of joining parts, or affording thicknesses of sections such as could be recommended in work that has to be riveted.

The lowered weight counts for economy of operation in that the flywheel effect is reduced to a low ebb; difficulty in steering will therefore be less, and the wear on tires, due to gyroscopic action, will fall to the low limit. It is, of course, difficult to appreciate that flywheel effect is a factor in this work, but those who know the good qualities of a large mass in the flywheel of the motor will most readily understand that it is a real force; if this actual force is so placed that it can do damage instead of good it stands to reason that the less of it there is, the better.

The idea of having an inflated tire along is catered to in this example, and since the tire may be mounted on an extra rim ready for instant use the amount of trouble the autoist will be put to on the road is minimized. Then, too, tires depreciate unless they are properly stored. With a tire mounted on a rim and somewhat inflated, provided it is covered to keep out light and dust, it is in a position of vantage.

The rim will take either clincher, quick detachable or Dunlop style tires. One of the parts of the rim comprises one clincher and substantially the whole of the base; the other the second clincher. The former is provided with a series of rectangular projections on the under side of the base all around the edge; the latter, with mating members, engage with the projections on the former. When the two parts are put together the extending feet first

Fig. 5—Putting the outer rim in place

Fig. 6—Locking (or unlocking) the rim

pass between the projections, and by means of a special tool one part is then rotated slightly with respect to the other so as to cause the projections and the mates to interlock. The two parts are securely held in this position by a hinged spring pressed key or lock fitting between one pair of the horizontal locking devices. The device is readily unlocked.

The tool furnished with the rim consists of a base plate which is slotted to pass over the square part through which the valve stem passes. The sides of the extension and of the slot are inclined so the tool can be passed over, only from the side, and not from the top. To this base plate is pivoted a lever arm which, when the base is slipped in place, engages behind one of the extensions and a twist on the lever arm then shifts the loose clincher until the bayonet joints are firmly interlocked. When a tire is to be placed on the rim, the sequence of operations is as follows: The tire is first placed on the wider part of the rim lying on the floor, and in case quick detachable tires are used, care must be taken to see that the tube is properly placed under the flap; then the smaller part of the rim is placed in position, care being taken that the flap does not prevent it from seating properly. The tool is then placed in position and the lever is drawn to the right to close the rim. When Dunlop tires are used on these rims, rubber bead fillers must be placed in each clinch of the rim. The regular flaps are used in the case of both types of clincher covers, and valve spreaders on tubes with all types of quick detachable tires. The operations in removing the tire from the rim are the reverse of those necessary in applying.

Digest

EXTRACTS ON TECHNICAL LINES FROM 50 BEST FOREIGN PAPERS—EXAMPLES SHOWING INFLUENCE OF WEIGHT AND GEAR RATIO ON CONVENIENCE IN OPERATION—VALUE OF TWO DIRECT DRIVES

The travelling qualities which will be produced by fitting a certain body to a certain chassis, or by selecting a transmission gear with three gear speeds instead of four, or with a new ratio between the different gear speeds instead of one which has already been tried, may be more economically figured out in advance than it may be ascertained by trials at the factory or by purchasers of the vehicle in practice. And the same applies to the number of seats with which the automobile is provided and the load with which it, therefore, may be expected to be operated in daily use. The various resistances which a motor must overcome are: (1) the rolling friction, which may be taken as equaling about 13 kilos per ton (28 3-5 pounds per 2204 pounds) on good, hard roads; (2) the resistance to penetration of the atmosphere, which is about 6.5 grammes per square meter of front projection of the vehicle for a forward speed of one kilometer per hour (author says 1 meter per second, but this is a slip) and growing with the square of the speed. On hills there should be added to this about 10 kilos per ton (22.04 pounds per 2204 pounds) multiplied by the percentage figure of the incline. If the vehicle weighs 1 ton this makes a resistance of 50 kilos on a 5 per cent. hill. Assuming that a vehicle weighing 1,000 kilos and with a front-projected area of 1 square meter travels 84 kilometers on a level road, the power developed by its motor may be calculated approximately by means of those figures. The road resistance is 13 kilos; the air resistance is 84 squared multiplied by 6.5 grammes, which equals 45.85 kilos and makes the total resistance 58.85 kilos. This is overcome at the rate of 84 kilometers per hour, or 23.3 meters per second, and 58.85 kilos multiplied by 23.3 meters per second makes 1,373 kilogramme-meter-seconds, which equals 18.3 horsepower, since 1 horsepower equals 75 kilogramme-meter-seconds. The horsepower at the wheel rim must, therefore, be more than 18 horsepower. If the vehicle is supposed to be in direct drive with an efficiency of transmission of 72 per cent. at the wheel rim, the motor must then develop 25.4 horsepower.

If the vehicle weighed 2 tons instead of one, a 30-horsepower motor would be necessary in order to reach the same speed on a level road; or, with the same motor of 25.4 horsepower, the 2-ton vehicle could reach a speed of 71 kilometers per hour, a speed reduction of 15 per cent. due to increase of weight. If, instead of increasing the weight, we increase only the front-projected area, as by attaching a wind shield, making the area 2 square meters instead of 1, the vehicle can only reach 68 kilometers per hour, meaning a speed reduction of 19 per cent.

Let us now compare the running of two vehicles, one weighing 1,000 kilos with a projected area of 1 square meter, the body being, for example, that of a runabout or a torpedo shape, the other a limousine with 2-square meter resistance-area. Both are supposed to have a motor of a maximum power of 28 effective horsepower at 1,200 r.p.m., and an efficiency at the wheel rim of 72 per cent. so that the power at the rim will be about 20 horsepower for each vehicle. The transmission ratio is supposed to be such that the light vehicle A will make 84 kilometers per hour on direct drive when the motor turns at 1,200 r.p.m., and the second vehicle B will make 66 kilometers per hour at the same motor speed.

A 3-per cent. hill is encountered. Vehicle A could scale it at 73 kilometers per hour, and vehicle B at 48 kilometers, if it were possible to maintain the motor speed at 1,200 r.p.m. But the connection between the motor and the wheels is supposed to be rigid. At 73 kilometers the motor vehicle A will give only 19.6 horsepower, and at 48 kilometers the motor of vehicle B will give only about 16 horsepower. The speed of these two vehicles will, therefore, go on diminishing on this hill of 3 per cent. until a state of equilibrium is reached—that is, until the resistances are equalled by the power available at the wheel rim. And this state of equilibrium is sure to be reached, because the power of the motor diminishes less rapidly than the resistances. Everything lies in knowing whether the equilibrium will be reached before the motor gets down to its lowest number of revolutions, say 400. It will, in fact. A calculation which is elementary, though somewhat lengthy, since it implies the solution of equations of the third degree, shows that equilibrium is reached at 70 kilometers per hour for vehicle A, the motor turning at 1,000 r.p.m. and developing 19 horsepower, and at 40 kilometers for vehicle B, the motor at 580 r.p.m. and developing 13.5 horsepower. In scaling the 3 per cent. hill, on the direct drive, vehicle A thus loses 15 per cent. of its speed, while B loses 26 per cent. What is the maximum gradient which these two vehicles can climb without changing gear? This must be the gradient which they can climb at 400 r.p.m. when the motor develops 9 horsepower at the rim, (If this statement seems doubtful, it measures at least the best which the very competent author can say on the subject; he evidently takes 400 r.p.m. as the minimum admissible for calculations.) Vehicle A will then run at 28 kilometers per hour and will scale

a gradient of about 7 per cent., while vehicle B will run at 22 kilometers per hour and will not climb a grade of more than 3.9 per cent. Similarly, a 5 per cent. hill may be scaled by vehicle A without change of gear at 58 kilometers per hour, with the motor producing about 17.5 horsepower. Vehicle B, on the other hand, will have to change gear, in which case two possibilities of construction are at hand. Either there is only one direct drive and the next gear below implies gearing down in the transmission box; or the transmission box has two direct drives, the speed next to the highest being also direct. Let us take, for example, a box with four speeds, of which one is direct, and the four gears in the following ratios: first to second as 0.46 to 1; second to third as 0.65 to 1; third to fourth as 0.77 to 1. This gives for vehicle B at 1,200 r.p.m. 66 kilometers per hour on fourth speed, 50 kilometers on third, 32 on second speed and 14 on low.

With this box, vehicle B will not be able to mount the 5 per cent. hill; neither on the fourth speed, as just referred to, nor even on the third speed. The efficiency of the transmission, which was 72 per cent. on direct drive, has, indeed, fallen to 50 per cent. by the gear reduction and the maximum power available at the rim will be 14 horsepower instead of 20—a loss of 6 horsepower due to the intervening reduction gear. Equilibrium would not result until near the vehicle speed of 12 kilometers per hour, at which the motor would turn at 250 r.p.m., which has been supposed to be impossible, the minimum assumed being 400. It must then be necessary to take the second speed, which will permit vehicle B to ascend the grade at 28 kilometers per hour with the motor developing 18.3 horsepower. The influence of the carriage body makes itself strongly felt. If it was not noticeable on the level road and was not enormous on a 3 per cent. hill, it becomes preponderant on a 5 per cent. hill. Vehicle A takes this on the direct drive and vehicle B cannot even take it on the third speed. No speed lever is touched on vehicle A, while the lever is manipulated four times on vehicle B.

The transmission with two direct drives gives different results. —By C. Faroux in *La Vie Automobile*, to be concluded.

Ability to vary the compression of a motor at will and the value of provisions aimed at he establishment of this feature in motor operation, are discussed. Actually one contracts or enlarges the admission port in order to slow up or accelerate a motor. This method of regulation has an inconvenience, because in throttling the admission, one reduces the compression. And ignition of the mixture which, thanks to the carbureter, remains of about the same composition becomes precarious below a certain pressure, the safe limit being about 2 kilos per square centimeter. If the compression could be maintained constant, such as by varying the volume of the compression chamber or of the stroke, extraordinary reductions of motor speed would become practicable, especially with ignition from a storage battery and coil. A vehicle could then be run through the streets of Paris on the high gear at the speed of a man's walk. Moreover, the fuel consumption per horsepower hour would be no greater for operation under the throttle than for full power, and this would be of the highest economical importance for the traffic in big cities, the same object being sought in taxicabs by using motors of small power. Outside of the cities it would become practicable to travel over level ground with low compression and poor mixtures and to increase the richness of the mixture where more power was required. Such a motor would consume little fuel on level roads, because it would be possible to adjust the compression and the mixture most suitably to one another for each motor speed. Whether these advantages would compensate for the complication involved in securing them is mainly a question of adroit construction.—*La Vie Automobile*, August 6.

To clean a honeycomb radiator of sediment the following method is recommended in preference to the use of a jet of steam. Prepare a 10 per cent. solution of potash. Heat it. When the boiling point is just reached, pour it into the radiator after closing the pipes which in service lead to and from the motor. Stir every hour for twelve hours by turning the radiator upside down. Pour the solution out by way of the same opening at which it was poured in. Screw a hose with water under pressure into the opening at the opposite end and run a stream through for a few minutes.—*La Pratique Automobile*, July 25.

Carbureters vs. Steam Boilers

DISCUSSING RELATIONS OF CARBURETERS TO INTERNAL COMBUSTION MOTORS; HOW THEY TAKE THE PLACE OF STEAM BOILERS

WHILE improvements have been made in automobile motors proper to a large extent, the fact remains that the thermal side of the situation has been a laggard more or less, partly on account of the question of ignition, and largely in view of the ever-changing gasoline problem, demanding always better carbureters; that is to say, devices that are capable of interpreting the thermal value of relatively non-volatile hydrocarbon fuel. In the early days it was easy enough to design a carbureter to handle the regular grade of "true" gasoline, the reason being that it was so volatile it would evaporate with great rapidity. As the demand grew more pressing it became necessary to add the more heavy distillates in greater or less proportion, and carbureter problems advanced to the first rank.

In the meantime the patrons of the industry found out by experience that the difference between a well-performing motor and a poor one was largely a matter of carburetion, remembering, of course, that the inter-relating problem involved the several questions of ignition. This version of the value of equipment influenced the situation until some of the carbureters that were utilized on motors from abroad were large and complicated devices; so pretentious, in fine, that they partook of the dignity of units rather than holding the less conspicuous position of accessories to the motors.

Considering that a carbureter must serve in precisely the same capacity as a steam boiler does in a steam power plant, it is not far astray to regard the carbureter in the light of an important unit rather than as a mere accessory.

In a steam plant the boiler is fed with water and by means of heat the water is turned into steam; the carbureter is fed with gasoline instead of steam, and the function of the carbureter is to turn the gasoline into vapor. Both steam and vapor of gasoline hold identical positions in a general way, considering the matter broadly (there are some differences), it being the case that steam is the vapor of water and vaporized gasoline

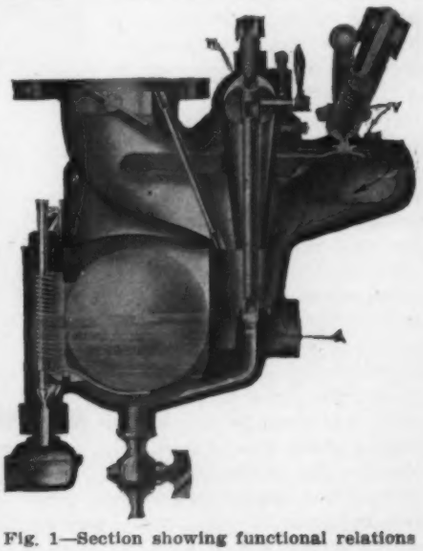


Fig. 1—Section showing functional relations

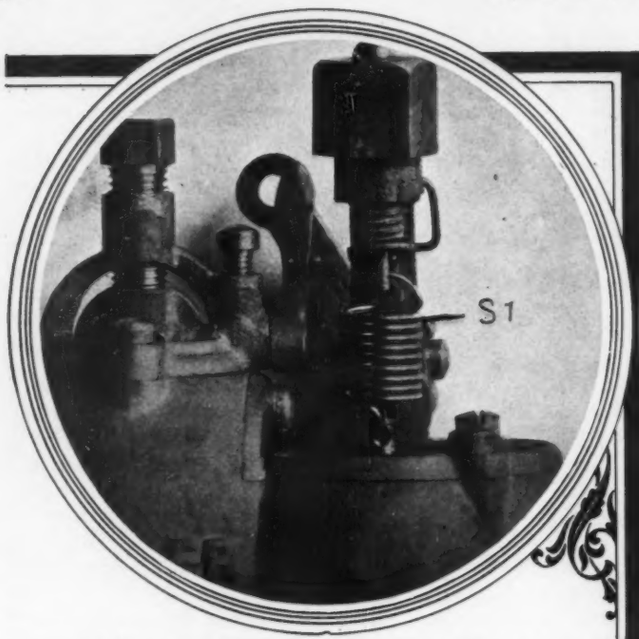


Fig. 2—Adjustment of the auxiliary air mechanism in the position of slow running passing least amount of air

Fig. 3—Adjustment of auxiliary air mechanism in the position of fast running, requiring the maximum volume of air

represents the equivalent. All compounds, as water, steel, copper, gasoline, carbonic acid, sulphur dioxide, anhydrous ammonia, etc., are supposed to reside in one of three states—*i. e.*, as solids, liquids, or in the gas state; these are called the three states of aggregation.

A carbureter must perform the service which is necessary when a liquid is changed from its then state of aggregation to the gas state, and it is just as necessary for the carbureter to boil the gasoline as it is for the steam boiler before mentioned to boil water in order to generate the steam that makes a steam engine interpret the heat units that are represented in it and furnish energy in acceptable form to the steam engine.

The fact is too frequently lost sight of that the gasoline that is fed to a carbureter must be boiled; the heat must be supplied to the carbureter for this purpose, and the nozzle of the carbureter becomes the equivalent of the "grates" in a steam boiler. Fortunately, it is not necessary to build a fire under a good carbureter, but the fact remains that a carbureter, to work properly, must be provided with a system of "grates" that will serve for its intended purpose; otherwise the liquid gasoline will be sucked up into the combustion chamber of the motor's cylinders, where it will provide but poorly, for then it will be necessary for the motor to perform the functions of the carbureter as well as to furnish power. Motors seem to be capable of doing this to some extent, but the service that can be realized from such a busy motor is far below that which is to be expected from a motor that is permitted to do what it is designed for, and not be compelled to work as a boiler.

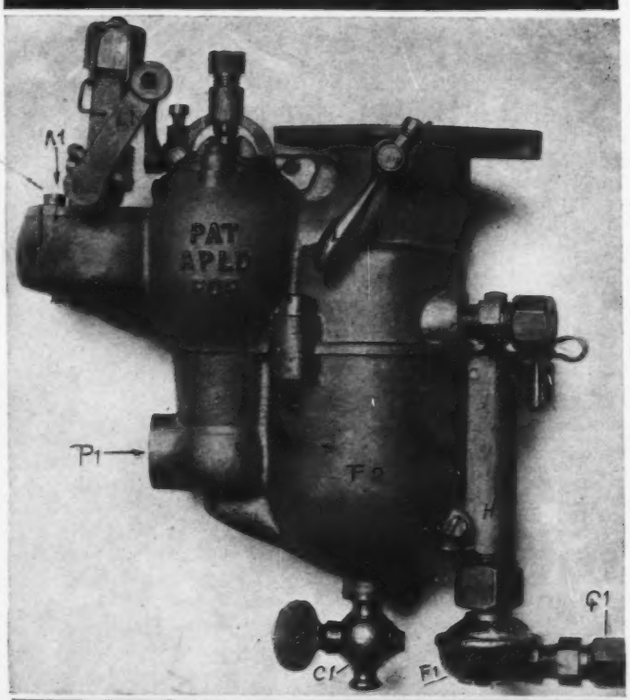


Fig. 4—Depicting the carbureter looking at the side showing the lever control for auxiliary air valve

The reason why a carbureter does not have to be provided with a hot fire under it is due to the low boiling point of the liquid used in it (gasoline); moreover, the gasoline has a lower latent heat of evaporation than this property in water, which is also a favorable circumstance.

Viewing the carbureter in the light of a supplier of vapor makes it a substantial substitute of a steam boiler. Remembering that it is not necessary to furnish heat at a temperature so high as to demand a fire, it remains to point out that there are differences in point of detail that must be given the care that they deserve in view of the importance of the undertaking. In a steam boiler atmospheric air is supplied to the burning fuel in the grate; when the fuel burns the heat from the flame is absorbed by the water in the boiler and the water is turned into steam; that is to say, the energy of the coal is delivered into the water, and when it goes into the cylinder of the steam engine it is absorbed by the piston, which in turn delivers it to the reciprocating parts, thence to the crankshaft, and on through the flywheel to the mechanism to be driven.

In the internal combustion type of motor, instead of delivering the air to the fuel and using it outside of the motor for the purpose of abstracting the heat from the fuel, the fuel is boiled in the carbureter at the low temperature that obtains in the absence of fire, and as the thus vaporized fuel is sucked into the combustion chamber of the motor it is mixed with the air so that upon arrival in the combustion chamber of the cylinder it is ready to be set on fire and burned. In this way the combustion chamber of the cylinder of the motor becomes a fire-box; the

Fig. 5—Presenting the mechanism for the auxiliary air control and the lever placed to actuate the same

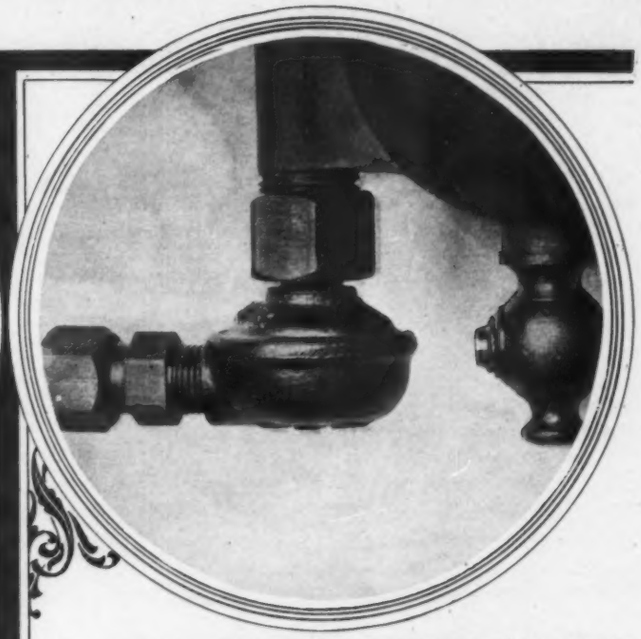


Fig. 6—Point of entrance of the gasoline to the carbureter, showing the filtering device and pipe connections

heat of the fuel is transferred to the piston just as it is absorbed from steam, and the translation from this point on is precisely as in a steam engine.

The difficulties of carburetion are many, and if account is taken of the fact that there is barely 2 per cent. of liquid gasoline in the mixture that is burned in the combustion chamber of the cylinders of the motor it will be seen that it is quite a job to properly regulate the flow of fuel with a view to obtaining the best result. This trouble would be comparatively simple were it possible to run the motor at a constant speed, and maintain nearly a constant load as well. In automobile work neither of these conditions can be maintained, and in order to meet the varying conditions, and cope successfully with the natural troubles, it is necessary to provide a carbureter that has a separate means capable of performing each of the functions, not only separately, but in an inter-related sense as well.

The conditions that have to be satisfied are:

(A) The carbureter must be capable of supplying a rich mixture in order to be able to readily start the motor.

(B) The carbureter must be capable of delivering the required amount of fuel (mixture) to the motor without serving in the capacity of an obstruction to the filling of the cylinders.

(C) The mixture must be varied as to quantity at will.

(D) The richness of the mixture must be a controllable factor; if a rich mixture is required it should be rendered available; if a lean mixture is indicated by the conditions the means should be afforded to readily and precisely obtain the same.

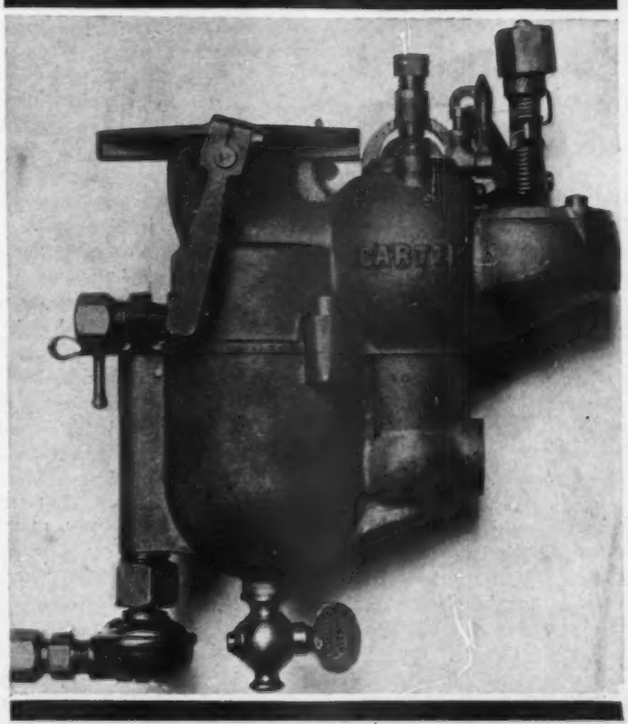


Fig. 7—Other side of the carbureter presenting the remaining lever positions; attention is called to the cock at the bottom for draining out residuum

(E) The carbureter should be so designed that it will work automatically within certain limits.

(F) The driver of the car should have at his disposal the means for relieving the automatic feature of its responsibility under certain conditions.

The Carter carbureter, made by the Carter Carbureter Company, St. Louis, Mo., will serve for the time being as an illustration of the points to be here made. In the illustration, Fig. 4 is an exterior view at one side and Fig. 7 an exterior view of the other. Referring to Fig. 4, the gasoline enters at G1, passes into the filter F1, thence up in the needle-valve tube H1, and, under control of the needle, into the float bowl F2. As the occasion demands, the residuum, and water, if any accumulates, are drained out through the cock C1. Primary air enters at P1, and the auxiliary air passage is at A1, the control of which is brought about by manipulating the lever L. The mixture, as it passes to the intake, and on to the combustion chamber of the motor, may be throttled by working the lever L2.

In starting the motor it is not necessary to resort to priming for the reason that an anti-strangle tube is placed (see O, Fig. 1) in such a way that, when the butterfly throttle-valve, which is under the control of the lever L2, is in the closed position, the mixture must pass to the motor through the anti-strangle tube, and the tube being small in area the mixture is relatively rich. If the mixture is too rich all that has to be done is to open the butterfly valve a little and more air will then pass up with the rich mixture; starting, under these conditions, is assured.

To obtain a better view of the situation it will be necessary to study Fig. 1 and become familiar with the parts and their relations. Referring to this illustration, it will be found that there are three methods of supplying air to the carbureter—(a) through A, which leads to the depression chamber; (b) the auxiliary air passageway V, and (c) the high-speed air inlet H. This illustration also shows the construction in general, and among the points of unusual design that are to be noted is the spherical float in the bowl. This float rests on a flattened lever and is free to revolve, but it is so housed in that it cannot depart from its rest. The flattened lever is fulcrumed at a point near the other extremity, and the needle valve is manipulated through the raising and lowering of the float, which in turn is caused by the changing level of the gasoline, due to the use of fuel by the motor. The general operation of the float bowl and the method of control of the gasoline is not different from the usual run of carbureter float systems.

In the manipulation of this carbureter the air opening for high speed is regulated once for all, and there being no regulation for the initial opening there is nothing further to do than to regulate the auxiliary air. It is in this particular part of the carbureter that novelty resides, beyond the fact that the nozzle differs in marked degree from the conventional form of nozzle.

Referring to the auxiliary air valve, the method of control is by means of a lever that is usually placed upon the dash of the car within reach of the driver. The lever connects with the motion as shown in Fig. 5. Referring to Fig. 2, the motion is in the vertical position, which is the one that permits the spring S1 to pull the strongest so that the valve is held to its seat and the air that is used up by the carbureter is mostly supplied through the primary intake at the bottom.

When the demand for air increases, the suction will also be on an increasing basis and the spring S1 is elongated; but if the driver desires to admit more air through the auxiliary intake all that he has to do is to pull the lever on the dash in such a way as to tilt the spring S1, as shown in Fig. 3. This operation has the virtue of lowering the tension of the spring S1 and the auxiliary inlet valve will then open more easily, the suction of the motor furnishing the force.

Don't

ANOTHER INSTALLMENT OF SHORT-METER ADVICE TO THE TYRO—AND THE EXPERT—THE FOLLOWING OF WHICH MAY SAVE THE MOTORIST HEAPS OF TROUBLE, PERHAPS SOME MONEY, AND PROBABLY A LAWSUIT OR TWO

Don't overlook the characteristics of ball bearings; they are made of hard dense steel in order to induce a high polish; it is this high polish that renders them fit; acid in the grease will etch the surfaces, thus destroying the high polish, hence ruining the bearings.

Don't think that the steering gear is everlasting merely because it is housed in; look over it, flush it out, put in a new supply of good lubricant; eliminate the lost motion.

Don't neglect to determine the cause of loss of compression; a lazy motor is not to be regarded as a joy forever.

Don't think that the timer is so made that you will never have to look at it; disregard of its construction will result in leaving you in the lurch some day—it may be several miles from the bark of a dog.

Don't go by a school-house like a whirlwind; how would you like to have your own children placed at the tender mercy of a lunatic with an automobile for a weapon?

Don't dispute the right of way with a fire engine; besides being a formidable rival it may be on its way to put out a fire at your house or place of business.

Don't tell "fish stories" about the speed you make on the highway; people become prejudiced when they hear them. The teller of such stories, if it is the truth, admits that he is a lawbreaker.

Don't stop at every road-side "resort"; the scenery is more attractive just as Nature made it; an automobile is an economic contrivance of value just in proportion as it does good to humanity; it is not in a good service standing in front of a "resort."

Don't go too far in any one day; there is another day coming.

Don't drive at night if the lighting equipment on your car is out of order.

Don't try out your new 50,000-candle power headlight on the public, in town; go out in the country and compete with fireflies.

Don't invite strange children to ride in your car; it gives them bad habits; you may be misunderstood.

Don't entertain the notion that dust is healthy for others; if your curiosity is excited try some of it yourself.

Don't argue with yourself about the difference between right and wrong; you know the difference without being convinced anew.

Don't overlook the fact that a four-cycle motor is, in reality, a four-stroke cycle motor. In other words, there are four operations necessary to the completion of the cycle, *i. e.*, suction, compression, expansion and exhaust.

Don't forget that it takes two revolutions of the crankshaft to deliver four strokes.

Don't count ignition as one of the operations in the four-stroke cycle motor—ignition is but an incident in counting the operations that make up the cycle.

Don't imagine that the differential gear that is placed in the live rear axle can be done away with advantageously; it is put there to weigh out the torquing moment to the two traction wheels, permitting each to go at its natural speed—one of the wheels must go faster than the other in rounding a curve unless one of the tires slips.

Don't add all the complications that the world affords to your automobile; get everything that will be of value; eliminate everything that can be of no adequate service.

Don't go on a tour with a large number of poor tools; take along a few good ones.

Don't forget that you ought to pay for a chicken if you kill it; don't kill the fowl if it can be avoided.

Don't invite your friends for a drive and then begin to show off. Remember, their necks may be worth something even if you do not place a value upon your own.

Don't forget that it is the polish on the balls of a ball-bearing that is of the greatest value from the point of view of long life and efficient service.

Don't think that balls made of inferior material will take a high polish; it may look high to the naked eye, but a microscope will disclose the fallacy.

Don't imagine that sand in the housing of the ball bearings will have any different effect than the same sand would have were it placed in your eye instead; it makes the balls blink.

Don't expect good service from ball bearings if they are placed in a gear-box and the chips from the gears are allowed to mingle with the balls; the way to keep out of the trouble that will follow is to keep the gear-box cleaned out.

Don't fail to take into account the ruinous effect of oil on the tires, but if the tires will rot cut if they are steeped in oil how about the high-tension wiring around the motor? It, too, has rubber for insulation.

To Keep a Car Looking New

M. C. HILLICK GIVES A FEW HINTS AS TO HOW TO PRESERVE THE FINISH OF THE AUTOMOBILE

PRESERVATION of the automobile finish is quite as important as developing and rounding out the finish, although the former is, as a rule, quite out of the hands of the painter. Having made the painting and finishing as fine and rich and reliable as it is possible for skill and expert trade knowledge to do, the painter can thereafter serve only in the capacity of an adviser. It is fair and reasonable to say that at the present time plenty of automobile surfaces suffer abuse and go to premature decay through a lack of knowledge on the part of owners and chauffeurs of the particular sort of treatment which such surfaces need.

The highly finished surface, with its outer coat of great brilliancy, is more sensitive than any other material applied to the automobile. It requires, therefore, a care and treatment proportioned to its delicacy.

To know the best means of preservation it is essential first to understand at least in a general way some of the main causes for the decay and premature collapse of the finished surface.

Cracking of the varnish may, of course, be due to two causes: Old age, at which stage of life all varnish is destined to check and fissure and eventually lose its capacity for preserving and beautifying the surface. Premature cracking due to hurried methods of painting and finishing, by which method one coat of paint, or color, or even varnish, is applied over a coat of material not thoroughly dry. This soft, porous, and undried coat generates a gas when confined under another coat, with the result that the gas forces an outlet by cracking the surface. The cure for this latter form of surface disruption is chiefly within the hands and under the control of the painter. The fissuring of the surface incident to old age, on the contrary, depends upon the care and preserving processes practiced by the automobile users, chauffeurs, and so on. The life and usefulness of varnish can be greatly prolonged by proper care and treatment such as for example, frequent washing of the varnished surface with clean, cold water. Water cleanses and cools the varnish, strengthens it, and, in its early days of wear upon the surface, increases its brilliancy and enriches its appearance. Do not wash the surface in the sun nor permit it to dry in the sun. Neither wash it in a freezing atmosphere. During cold weather wash it no less often than during the summer months, but provide a warm apartment for such work.

Spotting of varnish—depriving the surface in spots of its lustre—is a bad form of surface blemish which the automobile owner and user who admires the beauty and brilliancy of his machine needs to guard against. Spotting generally occurs during the early life of varnish—before it becomes old, and harsh, and brittle, and devoid of elasticity. It is due chiefly to the accumulations of mud drying upon the surface and thus through the power of capillary attraction extracting the oil from the varnish. This action in many cases not only extracts the oil but the gum constituent as well. City mud, and of course, the mud of lime districts, the former being strongly charged with ammonia, are notoriously destructive to varnish lustre. The automobile driven in the mud of either city streets or country roads should upon return to the garage be washed immediately thereby eliminating the actively destructive medium.

Soapy water, or dirty water, in fact, is a form of spotting which sometimes occurs in garages and repositories, and which is very difficult of effacement. It very often happens when this soapy or dirty water is permitted to dry upon the surface it leaves a disfigurement impossible to remove except the surface be rubbed with water and pulverized pumice stone and water and revarnished. The lesson is, therefore, to avoid splashing unclean water on the surface, and never to wash the automobile with anything but absolutely clean water.

Coal gas and the gas which sometimes percolates through heating pipes will cause, if not at once, certainly in time, a very bad form of spotting. This form of spotting may be recognized by the dull, lustreless spots, showing a film of greasiness, which afflicts the surface. Damp, ill-ventilated garages cause a great deal of varnish and surface spotting difficult, and often impossible, to rid the surface of. Frequent washing and sun baths assist to both prevent and cure the evil. This treatment failing, nothing remains but to rub the surface down and revarnish.

Pure, fresh air brought into the storage quarters of the automobile in a quantity sufficient to counteract the accumulating foul air, fetid odors and gases, will prevent the varnish spotting and loss of lustre here referred to. It is a feature of economy which the garage manager and automobile owner should alike be vitally interested in.

Complaint on the part of owners and users of automobiles painted in dark colors is widespread concerning the greening and discoloration of the varnish, thus destroying to a greater or less extent the natural attractiveness of the colors and combinations of colors employed. This is due, for the most part, to the too close confinement of the automobile in an insufficiently lighted room. A lack of light affects the varnish disastrously, and in greening and discoloring it the color over which it is used is likewise injured, if not rendered of no effect outright. This emphasizes the need of a great amount of light—really the more the better—for the garage in order to preserve the original and native quality of the finish.

Practical Lubrication

THE IMPORTANCE OF PROFUSE BUT WELL-REGULATED LUBRICATION IS BEING CARED FOR IN THE RIGHT WAY BY UP-TO-DATE MAKERS

DEPRECIATION is what the owner must guard against, and there is no better way to do so than to watch the lubrication. In service, it is the duty of the owner of a car to purchase and use good lubricating oil, but it will not be possible for him to do so unless the maker provides a place to put the oil and a means for its definite circulation. That the makers of automobiles are aware of this fact is shown by the care used in designing the motors, transmissions and other units with adequate provision for the storing and circulation of lubricating oil. There are several ideas in vogue and it will be profitable for the autoist who wants to limit depreciation to study the various methods and familiarize himself with their advantages.

As a positive means of lubrication with absolutely no danger of flooding the Marmon design is offered. Fig. 1 depicts the

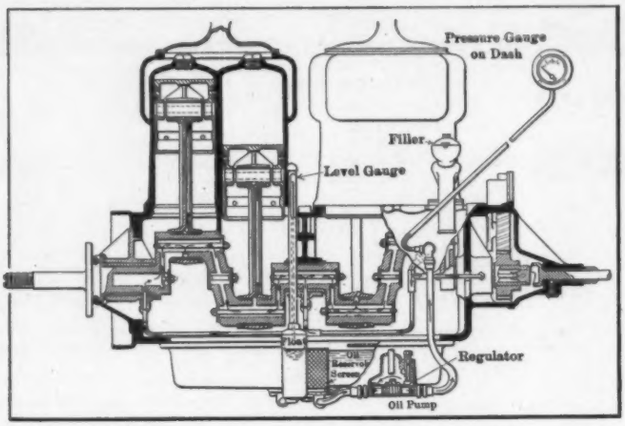


Fig. 1—Marmon lubricating system as adapted for 1911 motors of this make

1911 motor in part section, with an oil tank formed in the front end of the bottom half of the crankcase and a gear pump placed therein to circulate the oil. The direction of circulation is shown by arrows and the pressure generated on the oil is indicated by a gauge which is located in sight of the driver. In order to be able to tell if the supply of lubricating oil is adequate a float is placed in a well in the tank, from which a telltale is operated, by means of which the driver may determine the condition of the oil supply. The crankshaft is bored out to form oil-ways through which the oil flows under pressure to the main and crankpin bearings, and by a system of ducts the lubricant is also forced up to the wrist-pins so that they too are lubricated by oil under pressure. All excesses are returned to the well, but the oil is filtered on the way, and the economy of the system is decidedly pronounced, without running into the danger of using "stale" oil. The mere fact that a little oil is put into the tank daily is sufficient to guard against having it wear out, but it must be remembered that lubricating oil does wear out just as does a suit of clothing or a pair of shoes. When it is depleted of its slippery properties it must be gotten rid of and in this system means for cleaning out the residuum are at hand.

In the system as here depicted the pressure is sufficiently high to maintain the circulation, even against the conditions that obtain when the lubricant is of a poor grade. That any lubricating system is prone to be stopped up by accumulations of paraffine is well appreciated and in the earlier practices this was one of the most prolific causes of trouble. By maintaining a sufficiently high pressure there is no danger from this serious source of trouble. The greatest good comes when the oil is of a proper grade, even if the system can cope with foreign accumulations.

Collins High-Duty Axles

NEW IDEA IN LIVE REAR AXLES; BEVEL GEARS USED FOR TRANSMISSION WORK; LIGHT AND STRONG REAR AXLE UNIT DEPICTED

EXCESSIVE unsprung weight has always been the stock argument against unit types of live rear axles, and that there is something to be said against having too much weight on the live rear axle is now regarded in engineering quarters as a fact. The other side of the question has its advantageous angle, that is to say, practice has sanctioned the placing of the transmission gear integral with the axle. Just why this form of construction works so well is not readily explained, but many of the most silent performers that are to be seen on road and boulevard are built in just this way.

The Collins Axle & Manufacturing Company, Frick building, Pittsburg, Pa., has completed the designs of a line of axles of this class, and the illustrations here offered are made by the wax process from working drawings in order to bring out the real matters of interest and to show that lightness is a pronounced feature, not, however, at the sacrifice of due strength.

In giving this matter thought for the purpose of discriminating, it may as well be remembered that, while the pyramids, for illustration, were made of great strength, at the cost of thousands of tons of material, even granting that they have survived the ravages of time and eaten into centuries, they have ever resided on one spot of earth. Automobiles, on the other hand, as the word implies, are mobile, that is to say they move about.

Even bridges, although they are made of kinetic material, would fall short of the requirement were they to be used in the manner as laid down for automobiles, and, when the situation is properly canvassed, it will be seen that success, from the point of view of the proper design of automobiles, demands that the design be on a kinetic basis.

When the members of a structure, as the columns of a building, are subjected to quiescent loading, as they are, the load is static; there is no shock, vibration, or other consideration, and the static moments are all that have to be taken cognizance of. But if the attention of the reader be attracted to the crankshaft of a locomotive, for purposes of illustration, it will be quite apparent that the character of the load is kinetic, that is to say, the crankshaft is subjected to shock, vibration, alternate bending, and all the other ills which are expressed by the designer as in the category of kinetic moments.

Likewise, in automobile designing, the work is of a kinetic nature, and castings, which are more or less incapable of doing this class of work, should be used but sparingly if at all.

Referring to Fig. 1 of the Collins axle, the shell S1 is of drawn steel, and the method of joining is by means flanging F1, with studded fastenings all around the circle. The spring

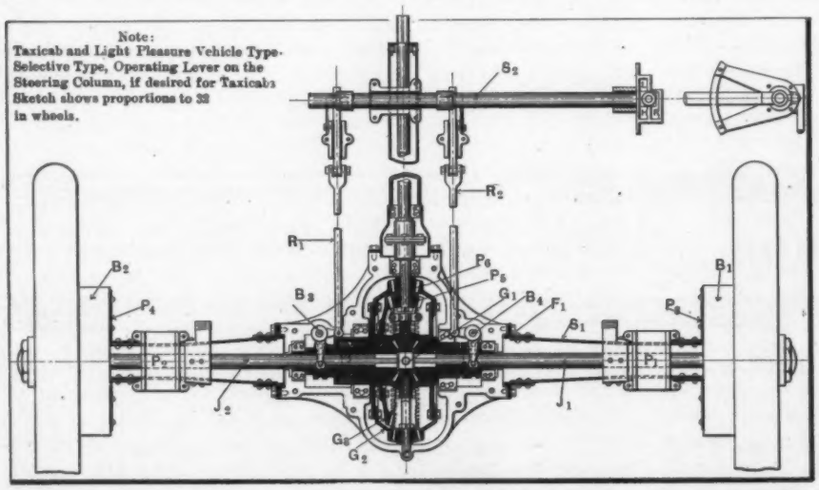


Fig. 1—Type of axle as designed for taxicab and light car work, using bevel gears in the speed change system

perches P1 and P2, are designed to accommodate wide plate springs which is in accord with the practice which is dictated by experience. The brake-drums B1 and B2 are provided with closure-plates P3 and P4, which are flanged to the shell.

The differential gear system G1 is of the bevel type within an oil-tight housing, and the jackshafts J1 and J2 are squared just where they fit into the gears of the differential system.

This axle is made to serve in taxicab work and for light pleasure vehicles. The sliding gear system is composed of a set of bevel gears G2 and G3, meshing with mating pinions P5 and P6. A means is available for withdrawing the gears from the pinions and for keeping one set out of engagement when the other set is working. This plan differs from other types of transmission-gear systems to the extent that bevel gears are used instead of square-cut gears. In the conventional square-cut gear systems it is necessary to clash the gears endwise, that is to say, axially, to engage them; in the bevel gear work the gears are brought into mesh by throwing them together so that contact is all along the faces of the teeth, thus eliminating the chance of over-straining a gear by bringing all the work upon a small portion of a tooth near its end. This gear affords two speeds, forward and reverse.

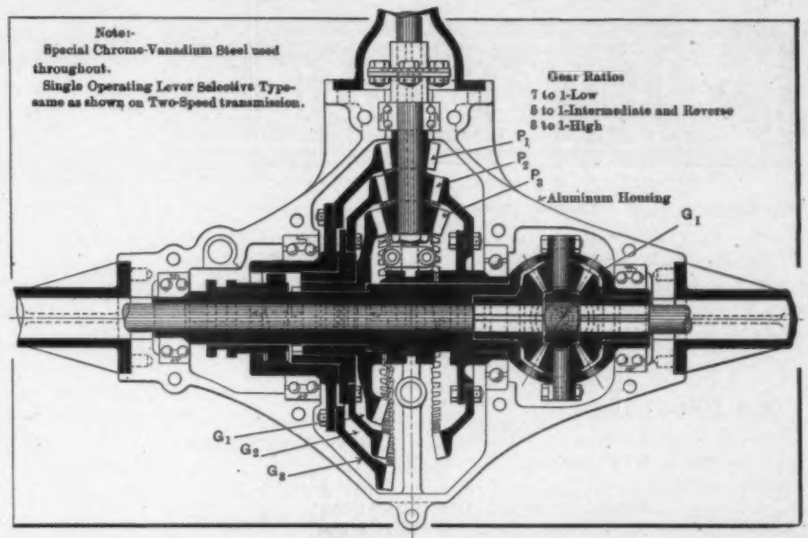


Fig. 2—More pretentious live rear axle with a bevel gear system for speed changes; designed for heavy duty

More Pretentious Type Made Also

As a further indication of the activity of this company reference is had to the larger axle, Fig. 2, with the differential gear incorporated into the system at the right side of the bevel type of sliding gear system. In this case the gears G1, G2, and G3 are nested just as in Fig. 1, but there is one more speed available in this case. These gears mate with the pinions P1, P2, and P3. In both examples the method of sliding the gears to attain the benefit of the respective speeds is just the same as that which is found to be practicable in general practice, as for illustration, the R1 and R2 (see Fig. 1) connect with bell-cranks B3, and B4, for the purpose of shifting the gears, and motion is imparted to the rods by the turning of the shaft S2, which is done by means of side-levers, or which may be accomplished by a pedal.

Construction Includes Fine Grades of Steel

In addition to the elimination of heavy and useless casting material, it was the purpose of the designer to utilize special grades of steel, as chrome-nickel steel in the parts that have to stand the brunt of the work. Heat treatment is resorted to in the process of coaxing out kinetic qualities, and lightness of the rotative parts is a factor to the extent that undue inertia is not a property in the design; this absence of inertia helps to a marvelous degree in the meshing of the gears, not only by reducing clatter which is disagreeable, but the teeth of the gears are saved from the merciless pounding that would otherwise be encountered.

Coming Events

CALENDAR OF FUTURE HAPPENINGS IN THE AUTOMOBILE WORLD THAT WILL HELP THE READER KEEP HIS DATES STRAIGHT—SHOWS, RACES, HILL CLIMBS, ETC.

Dec. 1.....Chicago, Ill., First Annual Aeronautical Exhibition in the Coliseum.
Dec. 31-Jan. 7, '11.New York City, Grand Central Palace, Eleventh Annual International Automobile Show.
Jan. 7-14, 1911...New York City, Madison Square Garden, Eleventh Annual Show, Pleasure Car Division, Association of Licensed Manufacturers.
Jan. 16-21, 1911..New York City, Madison Square Garden, Eleventh Annual Show, Commercial Division, A. L. A. M.
Jan. 28-Feb. 4, '11.Chicago Coliseum, Tenth Annual National Automobile Show Under the Auspices of the National Association of Automobile Manufacturers, Inc., Pleasure Cars and Accessories, Exclusively.
Feb. 6-Feb. 11, '11.Chicago Coliseum, Tenth National Automobile Show Under the Auspices of the National Association of Automobile Manufacturers, Inc., Commercial Vehicles, Pleasure Cars, Motorcycles and Accessories.
Mch. 4-11, 1911...Boston, Mechanics' Building, Ninth Annual Show, Licensed Automobile Dealers' Association.

Races, Hill-Climbs, Etc

Aug. 31-Sept. 8..Kansas City, Mo., Reliability Run, Auto Club of Kansas City.
Sept. 2-5.....Indianapolis, Ind., Speedway Meet.
Sept. 3-5.....Run and Labor Day Race Meet of North Wildwood Automobile Club.
Sept. 3-5.....Brighton Beach, Two-day Track Meet.
Sept. 5..... Cheyenne, Wyo., Track Meet.
Sept. 5.....Denver, Col., Road Race, Denver Motor Club.
Sept. 5.....Los Angeles, Cal., Speedway Meet.
Sept. 5-10.....Minneapolis, Minn., Track Meet at State Fair.
Sept. 7-10.....Buffalo, N. Y., Reliability Run, A. C. of Buffalo.
Sept. 9-10.....Providence, R. I., Track Meet.
Sept. 10.....Los Angeles, Cal., Mount Baldy Road Race.
Sept. 10.....San Francisco, Cal., Golden Gate Park Road Race, Automobile Club of San Francisco.
Sept. 10-12.....Catskill Reliability Contest and Hill Climb, Motor Contest Association.
Sept. 10-12.....Seattle, Wash., Race Meet.
Sept. 15.....Algonquin, Ill., Annual Hill Climb of Chicago Motor Club.
Sept. 16-26.....Asbury Park, N. J., Aviation Meet, Aero Club of America.
Sept. 17.....Syracuse, N. Y., Track Meet of Automobile Club of Syracuse, Syracuse Automobile Dealers' Association and the New York State Fair Association.
Sept. 24.....Belmont Track, Narberth Race Meet, Norristown Automobile Club.
Sept., middle of..Chicago, Commercial Car Reliability Contest of Chicago Automobile Club.

Foreign Shows and Races

May 1-Oct. 1....Vienna, Austria-Hungary, Automobile and Aviation Exposition.
Aug. 1-Sept. 15...French Industrial Vehicle Trials.
Oct. 15-Nov. 2....Paris, France, Aeronautical Society Show.

THE AUTOMOBILE

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H. M. SWETLAND, President
A. B SWETLAND, General Manager
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THOS. J. FAY, Managing Editor
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The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903, and the Automobile Magazine (monthly), July, 1907.

ROAD-WHEELS have a wider influence on autoists and the conclusions they reach regarding the state of the art than any other point in the design.

* * *

JUST in proportion as this part of the car is prominent from the point of view of the attention demanded of autoists they neglect it.

* * *

HUMAN nature seems to be that way; the things that are to be done as a matter of necessity remain undone, or are only taken up when necessity compels.

* * *

INGENUITY is far-reaching, it is true, but the supply of this quality is not always equal to the demand.

* * *

MOST tender of all spots with the average man is his pocketbook; this fact should have more effect upon autoists from the point of view of road-wheels than it does.

* * *

CERTAINLY, it takes a pretty penny to span the tire bill of the autoist who waits for the tires to give out before looking them over.

* * *

TRUE, it is quite an undertaking to remove and replace a 36 x 4 1-2-inch set of tires.

BUT the hard labor that clung so closely to the old clincher idea is only present with the man who fails to note that progress is being made.

* * *

THERE is now no occasion to struggle with a recalcitrant tire on a rusted clincher rim.

* * *

THIS year brings its crop of quick detachable and demountable rims; they are in various forms; choice is there for the most fastidious.

* * *

MUNSEY Historic Tour is over; the veterans of the long trek are returning to their respective homes, and glad of the chance.

* * *

PERHAPS it is not too much to say that the tour is "historic" in more ways than one; the section of country actually covered is rich in historical events; but the tour itself will go down in history.

* * *

AMONG the points of unusual interest lies the perfection that attended the management of the great event; it just goes to show that a large undertaking can be handled properly when the "captain on the bridge" has his ounce of stamina.

* * *

THEN, there is the record; the sum total of result; not merely the noticing here and there of this or that car as having a clean score; such matters will be given proper weight, to be sure.

* * *

AUTOMOBILES, taking them as a whole, stand up to the gruelling test of a long and strenuous run so perfectly that, while penalties may be exacted, the fact remains that they are for happenings that are well within the ability of the average autoist on a basis of making a road-side repair.

* * *

AUTOISTS owe much to the Munsey build of enterprise; it has broad utility for its foundation. The makers of automobiles that went into the run must also recognize the fact that a show-down such as this carries conviction—it is a mark of merit to be in such company even if a penalty is suffered; it is the penalty that comes when a man's fight is being waged with such vigor that a few scratches are the least to be expected.

* * *

GASOLINE is the residence of the energy that makes the automobile go. That it should present a problem or two is a reasonable expectation. So much energy in so small a package represents a giant done up in the gossamer web of the spider.

* * *

FORTUNATELY the composition of gasoline is such that, like the elephant that minds and works faithfully at piling timber for his master, a force is represented that is as docile as it is large.

The Week in Detroit

NEW COMPANIES INCORPORATED; NEW FACTORIES PLANNED AND IN PROCESS OF ERECTION; BRIEF TRADE AND PERSONAL NEWS

DETROIT, Aug. 29—Several new corporations are in the making here. Two or three have filed articles within the past few days; the others will follow suit in due time. Among the former is the Whitney Motor Car Company, with a capital stock of $150,000, which has opened temporary headquarters at 1416 Ford building. It is the company's intention to manufacture a two-cylinder, gearless, friction-drive roadster to sell for about $400. A model car already has been turned out and arrangements are being made to begin work on twelve other machines within the next month.

The officers of the Whitney Motor Car Company are: President, Brock C. Eby; vice-president, J. C. Hudson; secretary, H. C. Whitney; treasurer, George O. Tackles.

Detroit has had its first glimpse of the latest novelty in motor vehicles, the three-wheeled commercial car. The inventor, W. G. Wagenhals, has come here from St. Louis, Mo., and is trying to interest local capital in the organization of a company to make his machine.

Mr. Wagenhals has figured out that he can put his car on the market at $650.

If plans now under way materialize, the motor car may take a leading part in the settlement of Detroit's vexatious street-car problem. Adolph Gerhard, a former justice of the peace in Hamtramck township, is promoting a $100,000 corporation to operate a system of automobile bus lines in competition with the Detroit United Railway, carrying passengers at three cents a head and giving them transfers in the bargain.

The Culver Chain Company has been incorporated with a capital stock of $50,000, the principal stockholders being William Culver and Arthur Taylor, both of this city. The company has secured a building at 140 and 142 Madison avenue for manufacturing purposes and expect to begin operations shortly.

Two tire companies are among the recent incorporations. The Puncture Proof Tire Company already has opened for business at 229 Beaubien street. It manufactures pneumatic and solid tires for commercial vehicles as well as for pleasure cars. L. J. Haynes is secretary and treasurer of the concern. Another company with a puncture-proof proposition is the Cooley Automobile and Tire Co., which filed articles of association with the Secretary of State last week, and which will locate in Detroit. John B. Chaddock is president; L. D. Cooley, vice-president and general manager; F. H. McMullen, secretary, and B. C. Bastedo, treasurer. These, with George A. Erskine, constitute the board of trustees. The capital stock is $50,000.

The recently-organized Universal Motor Truck Company filed articles with the Secretary of State during the past week, capitalizing at $350,000. Work is already under way on its factory, which will be located on the Grand Trunk railroad, between Farnsworth and Thedore streets, in the northeastern section of the city. The site comprises three and one-half acres.

The Van Dyke Motor Car Company has turned out its first cars, the cars finding a ready sale. By fall the output will be 25 cars a day, it is announced.

Ground will be broken this week for a $30,000 addition to the plant of the Ford Motor Company, Ltd., of Walkerville, Ont., located on the river front in Walkerville. The plans call for a two-story building of reinforced concrete, 70 by 40 feet, with basement, which will be used as a machine shop. The first and second floors will be given over, respectively, to the brazing and painting departments. The addition will give the company 20,000 extra square feet of floor space. The Ford company's new sales building at Woodward avenue and the East Grand Boulevard begins to loom up very conspicuously. The concrete supports for the third floor are now being put in.

A total of 1,275,000 square feet floor space is represented by the six largest motor car and accessory plants now in course of erection in the city, some of which are nearing completion. This is distributed as follows: Dodge Brothers, 367,000 square feet; Alden Sampson Company, 316,000; Lozier Motor Car Company, 200,000; Hudson Motor Car Company, 200,000; Anderson Carriage Company, 100,000; Anderson Forge & Machine Company, 92,000.

Following the reorganization of the Abbott Motor Car Company the plant has been closed down for two weeks for an inventory and a complete audit of the books. M. J. Hammers, the new general manager, will familiarize himself with the details and will collaborate with the department managers in mapping out plans for the coming year.

A number of changes in administrative positions are chronicled. James Bourquin leaves the Chalmers Motor Company, where he has been superintendent, to become general factory manager of the Paige-Detroit Motor Car Company, which recently increased its capital stock from $100,000 to $250,000. Mr. Bourquin is a graduate of the engineering department of the University of Michigan, '04, and entered the employ of the Chalmers company when it was organized as the Thomas-Detroit. Previously he was associated with the Olds Motor Car Company in Lansing and before that with the Peerless Motor Car Company in Cleveland.

Edward H. Broadwell, vice-president of the Fisk Rubber Company, has become identified with the Hudson Motor Car Company in an important capacity. He has acquired considerable stock in the company and has been elected vice-president. As such he will have charge of the selling end. He will assume his new duties September 1.

Edward R. Hewitt, of New York, son of a former mayor of the metropolis and designer of the Hewitt truck, comes to the Metzger Motor Car Company's plant in the near future as technical expert. He is a brother of Peter Cooper Hewitt. The Metzger company now has 600 men at work and expects to be running full capacity by September 1.

Close on the heels of the estimate of 500,773 as the population of Detroit and its nearest suburbs, given out by R. L. Polk & Company last week, comes the official announcement from Washington that the census returns give Detroit alone, without its suburbs, 465,766 people, an increase of 63 per cent. since the last census. For this remarkable showing the automobile industry receives a large share of the credit, as previously indicated.

The Detroit Shock Absorber Company already has been organized with a capital of $5,000 to start with and articles have been filed in Lansing, with the Secretary of State. It is a close corporation, all the shares having been taken by the projectors, F. B. Hibbler and Maximilian K. Golden, who is the inventor of the device.

The Golden absorber is a V-shaped affair, the bottom of the "V" forming a circle, however. One of the arms is attached to the upper part of the spring and the other to the lower part. When the springs are suddenly compressed the arms come together, but a friction band, which may be adjusted to conform to the tension of the spring, causes the latter to recoil gradually. The inner construction is simple, consisting of a locking device operating on the wedge plan. Patents have been applied for. Mr. Hibbler is president and treasurer of the company and Mr. Golden is secretary and general manager.

Lewis A. Austin has resigned as secretary and assistant manager of the Autoparts Manufacturing Company, of Detroit, and after September 1 will be connected with the Western Motor Company, Logansport and Marion, Indiana. Mr. Austin's headquarters will be at Logansport.

Notes on Aviation

BY MARIUS C. KRARUP. A MISSING PRIZE—DELUSIONS OF SCIENCE—GOOD MATHEMATICS WASTED—LIFTING POWER OF HELICOPTERS—ASTRONOMY WANTED AND CLEAN LIVES—EXIT STABILIZER

IN all reports of aviatic performances during the past week the record of one fact or condition more important for judging the value of the performance than all the other facts combined is omitted. The state of the weather is given in generalities only and in terms which may be interpreted as the reader's enthusiasm or distrust dictates. A device to be attached to the aeroplane machine and suitably arranged for producing an automatic record of attacks by irregular atmospheric currents has not yet been invented. No prize has as yet been offered for a device of this nature, which should preferably be so arranged that the curve or curves plotted by it could be rendered in the telegraphic alphabet and reproduced by the receiver.

Aero scientists, as Lanchester, Finsterwalder, Wegner-Dallwitz and even Bendemann, assume that the force required for flying may be calculated according to the acceleration of the volumes of air affected by the thrusts, ignoring that the thrusting of an elastic gas against an infinite body of the same gas involves considerations almost entirely new in physics and incomparable at nearly all points to the motions of solids or liquids. But improvements in aeroplane physics will go on just the same in practice, while acceleration of air in air will remain an inapplicable conception, quantitatively and qualitatively; a mere empty concatenation of words to which there is nothing corresponding in reality; a "phantom thought."

Three pages of perfectly good mathematics in an esteemed European contemporary were recently devoted to the following puzzle: "An airship moves with a speed of 15 meters per second and creates thereby an air resistance of 75 kilograms. As one horsepower overcomes a resistance of 75 kilograms with a speed of one meter per second, there will in theory be 15 horsepower required for moving the airship. How many are now in reality used?" Students of aviation please prepare a diagram of the errors in the mathematician's premises and an estimate of the value of mathematics based thereon.

In experiments with co-axial helices of 6 and 8 meters diameter, a vertical traction effort of 530 kilograms has been obtained by Klingenberg through the employment of 93 horsepower, according to a detailed statement by the experimenter in *Zeitschrift des Vereines Deutscher Ingenieure* of June 18. With a 100 per cent. power transmission efficiency the traction effort should have been about 1,500 kilos.

To use a compass for guidance in crossing the Atlantic or any other wilds uncharted for aviation, with a craft which follows no keel, may have its difficulties, but there is a clear sky above the clouds, with sun or stars visible. Aviators must study astronomy, practice deep breathing and shun catarrhs.

There is a job waiting in aviation for every chauffeur who has lived so intelligently and decently as to endure a rise in altitude of two miles in one-half hour without mental and physical discomfort. The plums hang high for the airman.

Since the recent aviation meet at Reims the Voisin biplanes have been made without the vertical partitions which had been supposed to be "stabilizers." The change was introduced under guise of a "racing model."

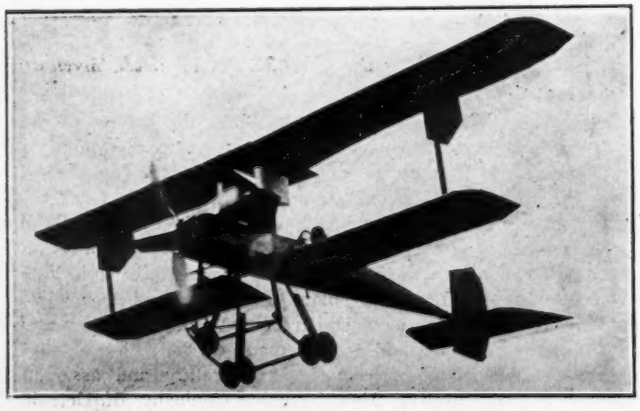
Prayers are heard to the effect that there will be no great need of rubber in aeroplanes. It is high enough.

Aviation News of the Week

BREGUET CONSTRUCTION IN PERFORMANCE—NEW ALTITUDE RECORD—WRIGHT FLIERS IN ATLANTIC CONTEST—WIRELESS MESSAGES

CABLEGRAMS from Lille, France, announce that Louis Bréguet took up five passengers on August 29 on his biplane, sustaining a load, including the gasoline, of 921 kilograms, equaling 2,026 pounds.

The Bréguet biplane differs radically from all other French machines. It is a double monoplane rather than a biplane, as the two supporting surfaces, of which the upper one is of much the larger area, are not stiffened one against the other by a number of uprights but only by two steel tubes at the small central section which carries the motor equipment and load, and by one similar steel tube on each side, arising from near the extremities of the lower plane. The air resistance is thereby reduced and the wings are rendered flexible. The ribs of the wings are of sheet aluminum pressed into U-shape and secured to a steel tube running the length of he wing. The upper wings are warped automatically and take different angles under the influence of the wind and at turns. Two lateral winglets are under control by the driver and two horizontal rudder surfaces in the rear serve to maintain the fore-and-aft balance. All the controls are obtained by means of a single steering wheel and post, the latter being jointed to admit of a rocking motion. The skeleton of the machine is entirely in trussed steel tubes supported on the ground by means of a wheeled chassis mounted in a special pneumato-hydraulic suspension. The power is derived from a 55-horsepower Renault aviation motor with eight cylinders, air-cooled and placed in V-shape, four in each branch of the V and the branches 90° apart. As tried in a recent contest conducted under the auspices of the Automobile Club of France by Mr. Lumet, this motor developed a little more than 60 horsepower and its weight was 179 1-2 kilos. In the Bréguet machine the motor is placed well forward and the three-bladed aluminum propeller in front of it, while the aviator and passengers are seated behind. The propeller shaft is geared down to reduced speed by mounting it on the camshaft of the motor, and the aluminum propeller blades are flexibly mounted upon three steel arms secured to the shaft. Starting of the motor and the machine is effected from the aviator's seat by means of a starting crank.



The Breguet double monoplane which carried six persons in flight Aug. 29 at Lille, France

The Gnome motor has recently been produced in a new form in which the intake valves are mechanically operated and placed

in the heads of the cylinders. The Gnome motor previously had automatic intake valves in the pistons, drawing the mixture from the crank chamber.

Managers of the aviation tournament to be held at Belmont Park, N. Y., announce that there will be prizes at the meet to the value of $50,000 and that, in addition, the contestants will get a share in the net revenues on some plan approved by them.

In a flight on August 29 Léon Morane, flying a Blériot machine, ascended to an altitude of 6,692 feet at Havre, France. This record was approved by the judges. J. Armstrong Drexel had reached the height of 6,752 feet in a Farman machine on August 12, at Lanark, England, and the Kew Observatory had verified this reading on August 20 by testing of the barograph carried by Drexel. The French judges, however, demand ocular as well as instrumental evidence for the establishment of a record. Brookins holds the American record of 6,275 feet made with a Wright machine at Asbury Park.

Preparations for the attempt by Walter Wellman, of Washington, D. C., and A. Vaniman, his technical assistant, to cross from Atlantic City, N. J., to some point in Europe by means of the almost dirigible balloon "America" are being actively carried on, and it is expected that rehearsals for the start can begin in ten days and that the departure may take place shortly thereafter. The filling of the great bag with hydrogen is almost completed but will be supplemented later to make up for leakage.

At the Harvard-Boston meet, to be held at Atlantic, Mass., September 3 to further notice, the three aviators, Brookins, Johnstone and Hoxsey, who fly Wright machines, will try conclusions with fliers of rival machines, this being the first occasion for the Wright corporation to enter into public contest against other machines claimed to infringe the Wright patents.

The new "headless" Wright flier shown at Asbury Park and reputed capable of carrying five persons has not developed any speed superior to the records made with other fast machines, particularly some French monoplanes and the Curtiss biplane, but then it has not been equipped with a motor of high power commensurate with the area of its supporting surfaces. It is believed it will be so equipped for the impending Harvard-Boston meet at Atlantic, Mass.

Experiments in receiving and dispatching wireless messages from an aeroplane in flight, such as were begun at Sheepshead Bay last week, will be continued at Hammondsport, N. Y., this week and thereafter. H. M. Horton has devised a sending apparatus and Lieutenant Culver, attached to the Signal Corps of the Department of the East, devised a receiving apparatus which was tried at Sheepshead Bay by J. A. D. McCurdy on the latter's Curtiss biplane. Lieutenant Culver and aviator McCurdy will conduct the experiments at Hammondsport, in both receiving and sending, and the results will be reported to the War Department.

J. C. Mars, one of the aviators who entertained the public last week at Sheepshead Bay, near New York, undertook to fly across the lower bay to Staten Island and rose to a height of about 2,000 feet, when a pump lever which he worked with his foot in order to supply the motor of his Curtiss biplane with extra lubrication, on the same plan as is followed in automobile racing machines, broke and the motor stopped working. The machine fell into the sea with considerable speed, but Mars was saved by the timely arrival of a tug boat.

Communications

VERY FEW HOUSES MORTGAGED TO BUY AUTOMOBILES; WANTS A NATIONAL LICENSING LAW FOR AUTOMOBILISTS; AFFORDING THE LATEST VIEWS IN RELATION TO THE EXPEDIENCY OF OWNING AN AUTOMOBILE

Very Few Homes Mortgaged to Buy Automobiles—For the purpose of arriving at the true facts and obtaining exact information relative to the rumors which have been so persistently circulated by some bankers, that automobiles were purchased by the wholesale with money secured by mortgaging homes, letters have been written to 24,000 bankers in the United States and enclosed was a blank form asking the bankers to state the number of people in their vicinity who had mortgaged homes or who had borrowed money to purchase automobiles, The bankers to state, to the best of their knowledge, the percentage of motor cars used for business or useful purposes and whether or not in the bankers' opinion the sale of automobiles would increase in their respective territories.

Replies have been received to date from 4,830 bankers who state that there are 198,216 automobiles in their cities and towns. Of this number only 1,254 have been purchased by the placing of mortgages and only 7,475 have borrowed money without mortgage to purchase automobiles. In the opinion of 3,229 bankers, the sale of automobiles will increase during 1911 over that of 1910, while 1,601 say the sales will not increase.

With less than one per cent. of automobiles bought on mortgages and less than 4 per cent purchased with borrowed money, recent claims of alarmists are conclusively proved to be practically without any foundation whatever.—Benjamin Briscoe, President United States Motor Company.

Wants a National Licensing Law for Automobilists—The man who operates a locomotive on a steel, perfectly protected road must be a man without blemish—you might say, almost the perfect physical man, and well balanced mentally. What kind of persons are allowed to drive automobiles on roads which may never have been leveled off or worked, which are allowed to go for months, yes, years, without any attention? Stones, rubbish, and all sorts and conditions of things allowed to accumulate thereon, all varieties of animal life allowed to roam at will on the road, endangering their own as well as other lives. The State will license any person over eighteen years of age to operate automobiles of any power or capacity, without regard to the physical and mental ability or disability of the driver. Such machines are certainly much more hazardous than locomotives. There must be better regulation of this rapidly growing sport and occupation. Lives must be safeguarded and the only effectual remedy is a national automobile law. Not only should a national automobile law fix the license fees, but it should be framed on just as stringent lines as the rules governing promotion of fireman to the rank of locomotive engineer. Only persons free from physical disability, and of sound mind, should be allowed to drive motor cars, and all should be compelled to pass a real, not a "fake," examination and undergo just as strenuous a medical examination as locomotive engineers and applicants for life insurance.

I always feel, when driving my car, that I am perfectly capable of taking care of myself and friends, and that I have absolute control of the car. I know the car because I live with it and keep it lubricated and in good running order all the time. But I am afraid of the other fellow. The fellow who always feels that he must pass you on the road. The fellow who dashes madly through town and city streets. The fellow who turns his corners as though the entire mechanism of the car was as sturdy as a battleship. The fellow who keeps his cut-out open day and night, in town or in the mountains. Those are the persons who will compel the Government to act in their own defense, for they do not seem capable of caring for themselves or safeguarding their fellow men. Welcome the day when Congress awakes to the necessity and passes a good national automobile law that will assure the utmost safety to citizens.—Allan Dale, Little Silver, N. J.

Standardization Coming

SOCIETY OF AUTOMOBILE ENGINEERS HAS APPOINTED COMMITTEE TO TAKE THE INITIAL STEP TOWARD THAT END

Following the decision made at the meeting of the S. A. E. at Detroit last month, the Standardization Committee of the Society has been organized: Howard E. Coffin, Pres., S. A. E.; Henry Souther, Hartford, Conn.; James H. Foster, Hydraulic Pressed Steel Co., Cleveland, O.; H. S. White, Detroit Seamless Steel Tube Co., Detroit, Mich.; Charles T. Jeffery, The Thomas B. Jeffery Co., Kenosha, Wis.; Elwood Haynes, The Haynes Automobile Co., Kokomo, Ind.; H. W. Alden, The Timken-Detroit Axle Co., Detroit, Mich.; Arthur Holmes, The H. H. Franklin Manufacturing Co., Syracuse, N. Y.; W. H. Van Dervoort, The Moline Automobile Co., East Moline, Ill.; D. F. Graham, The New Departure Manufacturing Co., Bristol, Conn.; G. E. Merryweather, The Motch & Merryweather Machinery Co., Cleveland, Ohio; A. C. Bergman, Simplex Automobile Co., New York; Coker F. Clarkson (secretary), 1451 Broadway, New York. It is the expectation to add to this list of committeemen as the occasion demands—the subject is a big one.

On August 22 the following new members were elected: Fred-Wm. Blanchard, Faulkner-Blanchard Motor Car Co., Detroit, Mich.; T. P. Chase, Chalmers Motors Co., Detroit, Mich.; Edward W. Curtis, Jr., Studebaker Bros. Mfg. Co., Chicago, Ill.; Henry L. Barton, Metal Products Co., Detroit, Mich.; DeWitt Clinton Cookingham, Rauch & Lang Co., Cleveland, O.; Geo. William Cooke, Pierce-Arrow Motor Car Co., Buffalo, N. Y.; Wm. Morris Davis, E. R. Thomas Motor Co., Buffalo, N. Y.; H. W. Gillett, Mgr., The Aluminum Castings Co., Detroit, Mich.; Edward Dixon, Thos. B. Jeffery & Co., Kenosha, Wis.; Frank E. Ferris, Brush Runabout Co., Detroit, Mich.; Starling Henry Humphrey, Brush Runabout Co., Detroit, Mich.; Geo. N. Hickey, Van Dyke Motor Car Co., Detroit, Mich.; Wm. H. Hogle, Brush Runabout Co., Detroit, Mich.; Harold H. Kennedy, The Waverly Co., Indianapolis, Ind.; Fritz Loeffler, Waldhof Fellstoffabrik, Manheim, Waldhof, Germany; Ralph L. Morgan, Ralph L. Morgan Co., Worcester, Mass.; Horace Henley Newson, McCord Mfg. Co., Detroit, Mich.; George L. Norris, American Vanadium Co., Pittsburg, Pa.; Charles R. Short, G. & E. Power Co., Philadelphia, Pa.; Nicholas Shamroy, Landau & Golden, New York City; Charles B. Rose, Velie Motor Vehicle Co., Moline, Ill.; Wm. H. Reddig, Chalmers Motor Co., Detroit, Mich.; Geo. A. Weidely, Premier Motor Mfg. Co., Indianapolis, Ind.; Clyde W. Stringer, Brush Runabout Co., Detroit, Mich. *Associate Membership.*—Albert F. Rockwell, The New Departure Mfg. Co., Bristol, Conn.; Winfield DeWitt Rhentan, The White Company, Cleveland, O.; R. A. Radle, Clark Sales Co., Detroit, Mich.; Thomas Towne, Ideal Opening Die Co., New York City; Walter Webster Totman, Whitney Mfg. Co., Hartford, Conn.; George S. Morrow, Stepmey Spare Wheel Co., Chicago Ill.; Henry May, Pierce-Arrow Motor Car Co., Buffalo, N. Y.; Frank E. Couch, 316 Hudson Street, New York City; Charles F. Case, Oliver Motor Car Co., Detroit, Mich.; Clyde E. Dickey, Denman & Davis, New York City; Wellington F. Evans, Metal Products Co., Detroit, Mich.

Good Fields for Vanderbilt and Grand Prize

The Vanderbilt Cup race, one of the most notable speed competitions of motordom, will start at dawn October 1. The course is laid out over the Long Island Motor Parkway and is one of the fastest road courses in the United States.

The turns will not be banked this year as they have been in the past, but will be widened in several instances. The Massapequa turn, which is on an acute angle, will necessarily be banked, but it too will be materially broadened. Practice over the course will begin September 20.

Entries for the event so far received are as follows:

VANDERBILT CUP

Car	Driver	Entrant
Simplex	Ralph E. Beardsley	Simplex Auto Co.
National	Not named	National Mot. Veh. Co.
Alco	Harry F. Grant	American Loco. Co.
Benz	D. B. Brown	Benz Import Co.
National	Not named	National Mot. Veh. Co.
Simplex	L. A. Mitchell	Henry B. Harris
Pope-H'f'd	Not named	B. C. Fincke
Pope-H'f'd	Not named	H. Emil Holt
Benz	Edw. Hearne	Benz Import Co.
Benz	Geo. Robertson	Benz Import Co.

MASSAPEQUA SWEEPSTAKES

Cole "30"	Endicott	Cole Motor Co.

For the Grand Prize race to be held October 15 there are entered to date fourteen cars of American and foreign manufacture, as follows:

GRAND PRIZE

Car	Driver	Entrant
Alco	Harry F. Grant	Amer. Loco Co.
Benz	B. Oldfield	Benz & Company
Benz	Victor Hemery	Benz & Company
Benz	Geo. Robertson	Benz & Company
Fiat	Louis Wagner	Fiat Auto. Company
Fiat	Ralph De Palma	Fiat Auto. Company
Fiat	Felice Nazarro	Fiat Auto. Company
Marmon	Not named	Nordyke-Marmon Co.
Marmon	Not named	Nordyke-Marmon Co.
Marmon	Not named	Nordyke-Marmon Co.
Marq.-Buick	L. Chevrolet	Marquette Motor Co.
Marq.-Buick	Robert Burman	Marquette Motor Co.
Marq.-Buick	A. Chevrolet	Marquette Motor Co.
Roebling-Planche	W. A. Roebling, 2d	W. A. Roebling, 2d

Premier Representatives in Convention

The annual gathering of representatives of the Premier Motor Manufacturing Company was held in Indianapolis Tuesday, Wednesday and Thursday of last week. Among the social events of the convention was a luncheon at the Columbia Club Tuesday noon followed by a banquet at the same place that evening. On Wednesday there was an automobile ride around the city, followed by a clam bake at Broad Ripple.

The guests of the company during the meeting were: R. M. Owen, New York; R. E. Ingersoll, New York; G. B. Kimball and R. I. Eads, Boston; John Guy Monihan and Allen Sheldon, Philadelphia; Mr. Avery and W. E. Stalnaker, Chicago; C. E. Gibson, O. G. Meyers and Lee Burns, Indianapolis; Elmer McConaha, Richmond, Ind.; H. P. Mammen, Evansville, Ind.; Louis Schwaebe, Los Angeles, Cal.; F. D. James, Tampa; H. O. Bell, Spokane; H. A. Bowman, Little Rock, Ark.; A. F. Chase, Minneapolis; H. L. Bracken, Salt Lake City; G. E. Ayres and J. F. Minton, Jr., Houston, Tex.; H. D. Walker, Greenwood, Tenn.; H. C. Stricker, Cincinnati; G. E. Schmitt and Fred Schmitt, Hamilton, Ohio; Edward Miller, Columbus, Ohio; W. C. Rowe, Beverly, Mass.; John O'Donnell, Providence, R. I.; C. C. Lake, Kansas City; Mr. Michiel and C. H. Martin, Pittsburg; H. P. Stratton, Petersburg, Va.; F. P. Miller, Jacksonville; B. D. Kent, Oklahoma City; W. D. Sanders, Columbus, Miss.; F. L. Riggs, Chattanooga; H. L. Ramsey and J. A. Dugan, Louisville; H. B. Pinkerton, Peoria, Ill.; W. J. Casterton, Detroit; J. H. Fleming, Scranton, Pa.; Thomas Neet, Versailles, Ky.; H. M. Allen, Lewiston, Mont.

Unconfirmed rumor has it that there will be a race meeting at the Brighton Beach race track Saturday and Monday, September 3-5. A number of well known racers are said to be entered, but the most painstaking investigation failed to show more than two that had been definitely made up to Wednesday afternoon.

The Capital's First Hill Climb a Success

WASHINGTON, D. C., Aug. 30—The first hill climb ever held in Washington took place to-day on Nayors Hill, under the auspices of the Automobile Club of Washington, and was a big success. The hill, an incline of ten degrees in seven-tenths of a mile, was in splendid condition and while the majority of the drivers were amateurs the time made was good.

A Buick 16, driven by T. C. Johnston, carried off the premier honors of the day by winning the free-for-all event, negotiating the distance in 49 1-5 seconds, the fastest time made during the day. Summary:

CARS LISTED AT $800 AND UNDER

Car	Driver	Time
Krit	Thomas Cadick	1:35:05
Hupmobile	E. Hamilton	1:39
Krit	K. Crittenden	1:40 3-5
Maxwell	B. Robertson	1:52 2-5
Hupmobile	H. N. Brown	2:00

CARS LISTED AT $801 TO $1,200

Warren-Detroit	Tom Berger	1:03 4-5
Ford	C. E. Miller	1:13 4 5
Oakland	H. Bauer	1:20
Ford	E. J. Drake	3:00

CARS LISTED AT $1,201 TO $1,600

Buick	W. Angle	1:09 2-5
Warren-Detroit	G. W. Wells	1:11
Parry	I. C. Barber	1:11
Petrel	A. Llano	1:15 1-5
Warren-Detroit	N. Bowles	1:21
Regal	Arthur Laroche	1:25

CARS LISTED AT $1,601 TO $2,000

Buick	W. Kronkite	1:02 1-5
Oakland	H. Bauer	1:02 3-5
Buick	G. G. Hamner	1:07
Apperson	G. Orme	1:13 2-5
Buick	G. Halstead	1:18
Apperson	J. J. Fister	1:19

CARS LISTED AT $2,001 TO $3,000

Matheson	W. B. McBurney	1:03 2-5
Columbia	R. A. Klock	1:26

CARS LISTED AT $3,001 TO $4,000

Matheson	W. B. McBurney	0:58
Matheson	A. D. Hall	1:07 2-5
Palmer-Singer	F. L. Lescault	1:02

FREE-FOR-ALL

Buick 16, Model B	T. C. Johnston	0:49 1-5
Matheson	H. Sanjen	0:53
Matheson	W. B. McBurney	0:56 1-5
Palmer-Singer	F. L. Lescault	1:02
Warren-Detroit	T. Berger	1:05

Safe Handling of Gasoline

(*Continued from page 356.*)

It would not be a paying investment, for illustration, to buy in "car lots" just to realize a small saving over the price of gasoline in barrel packages. The difference in price is not sufficient to compensate for interest on the investment together with the chances of deterioration, even if the means at hand for the storage of the fuel be up to the most fitting requirement. If an owner keeps a single car in commission, it is very likely that the storage tank will be sufficiently large if it will hold one barrel of the fuel. Should the demand be on a basis of two, three, or five cars, as is frequently the case in the more pretentious establishments, the capacity for the storage of fuel should be increased accordingly, but it is not believed that it would be wise to add capacity in direct proportion to the number of cars in commission. It is more than likely that the following will hold:

PROPOSED CAPACITY FOR STORING AUTOMOBILE GASOLINE

Number of Cars in Commission	Capacity of Tank in U. S. Gallons
1	50
2	50
3	100
4	100
5	150
6	150
8	200
10	250

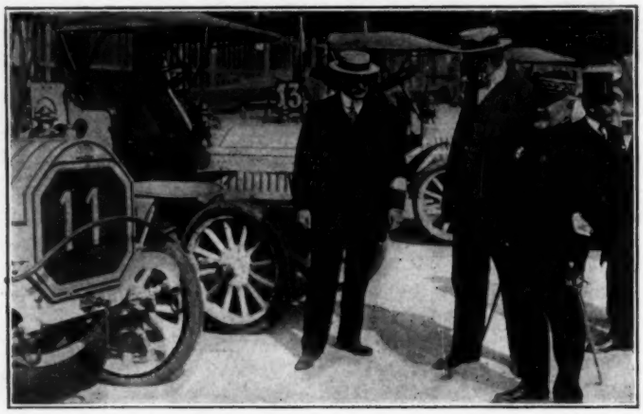
The plan that seems to work the most efficaciously and preserve the gasoline for the longest time, is depicted in Fig. 1, in which T1 is the gasoline tank sunk beneath the grade, outside of the line of the garage. The tank is filled through the filler pipe, F1, after which the cover, C1, is screwed into place and the lock, L1, is then used so that the owner will have control of the supply. The tank is ventilated by the fitting V1, which is connected to the tank at a point near the middle, using the pipe A1. The supply of gasoline is pumped to the gasoline tank of the automobile through the connection C2, by the measuring pump, P1, utilizing the suction connection, S1, which leads to the tank at a point near the end.

That the gasoline should be filtered as it is taken from the "package" and spilled into the storage tank is said to be a pressing need, and one of the devices used for this purpose in practice is depicted in Fig. 2, which, by spiral action and segregation, cleans the gasoline and permits of eliminating the sediment by cleaning out the filtering device as the occasion requires.

Problem of the Garage Involving Fuel

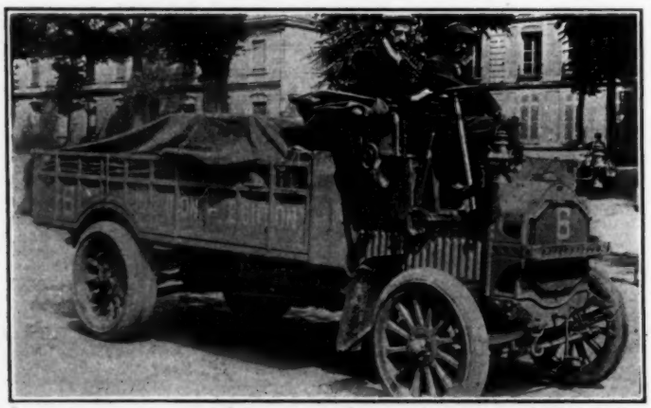
When garages are considered, the situation has to be handled somewhat differently; it is not possible there to bring all the cars to be supplied within a reasonable distance of the pump, and the supply may best be handled by means of a portable tank with a measuring pump attached to it. Just such a tank is here illustrated as Fig. 3. As will be observed, the tank, T1, is of convenient size and is fitted to wheels, W1, with casters, C1 and C2, at the front and a handle, H2, for the operator to grip when the car is being rolled about the garage floor. Gasoline is run into the tank through the filler opening, F1, and when it is filled the tank is locked, a padlock being applied for the purpose. By means of the pump, P1, gasoline is forced into the gasoline tank of the automobile requiring fuel, through the hose, H1, to which a suitable terminal valve, S1, is fitted, the idea being to be able to reach the filler of the tank of every make of car, and to be able to stop off the flow of gasoline quickly when the tank is full, in order to abort the spillage of gasoline on the floor of the garage. The pump is manipulated by turning the crank, C3. These facilities for storing and handling automobile gasoline are made by S. F. Bowser & Co., Fort Wayne, Ind., from whom the illustrations were procured.

Barry's French isn't up to much, but he is a well lubricated mechanic. It takes a brave man to face a stern world in which the greatest necessities are spelled out in a foreign tongue. Barry thinks an automobile is classed as A on the list of necessities, and coupling the car up to its little sisters, the garage, and gasoline, Barry contributes the rest, being a capable machinist, so that his use of the alphabet is by way of listing the first necessities of humanity in the manner as follows: (A) Automobile, (B) Garage, (C) Gasoline, and (D) Machinist—Barry. The sign over Barry's little garage is, therefore, a little shy on the arrangement of the letters, which does not interfere with his enterprise, and that he will make a go of it is taken for granted. Barry, being honest, and a good machinist, has a firm grip on the two principles that spell success.



General Breen, French Minister of War, inspects cars

The Berliet truck in the motor vehicle test



The De Dion-Bouton truck at the line-up

Portion of line-up of industrial vehicles at French contest

French Commercial Trials

COMMERCIAL motor manufacturers of France are now engaged in a competition having the advantage of allowing all to be winners. The test is a military one, organized by the Automobile Club of France at the request of the army authorities. The army must have commercial vehicles for its transport service, but instead of buying them outright it prefers to offer subsidies to private owners of an approved type of vehicle, on the understanding that the owners will present the vehicle for active service when called upon. It is in order to decide which are the most suitable types that the competition is being held.

Thirty-six vehicles, entered by nine different firms, are taking part in the trials. In addition there are two competitors in the omnibus section. There being no subsidies here, and little demand for 'buses outside the Paris General Omnibus Company, the response has not been hearty. Because of the army requirements, the thirty-six trucks entered for the competition show a large amount of similarity. They are in two distinct classes, carrying respectively two- and four-ton loads, but in many cases the difference between the two models is slight.

In addition to road capacity, the army fixes the size of the wheels, the width of tires, the road clearance, the size of the platform body, the ratio of weight to useful load; also it insists on protection for the driver, accessibility of all organs, protection of the radiator, hooks front and rear for hauling or being hauled, economy in fuel and lubricant, and the use of some device to prevent the vehicle running backward on a grade. It is because they are bound by these requirements that a certain similarity exists between the vehicles produced in entirely different factories.

The great majority of makers prefer to put their motors under the driver's feet. This is really not obligatory, but as the army requirements stipulate a platform of 11 feet 6 inches in length, it is difficult to find room for the motor under a bonnet. While there are plenty of details that could be improved under the heading accessibility, the average standard is high. The motors have profited by the improvements carried out on touring car models, with the result that piping is reduced to a minimum, valve stems are enclosed, electric wires are passed through a tube, the magneto is under a cover, and the under pan can be readily dismounted.

As three distinct fuels have to be employed—gasoline, alcohol and benzol—and as economy forms the basis of classification, considerable attention has been paid to carbureters. In the majority of cases the makers adopt some standard type and modify it according to their own ideas. Warming either by the exhaust or by the circulation water is adopted in every case, while many of the cars, in addition, have supplementary hand-controlled additional air supply. Only one type of ignition is now employed, namely, high-tension magneto, with, for every firm but one, a fixed sparking point. There is not a set of storage batteries to be found on the whole 36 vehicles. Lubrication, in the majority of cases, is assured by pressure feed to the main bearings, with in some cases the addition of troughs for the connecting rod ends.

A preference is shown by the army authorities for steel-shod wheels in place of solid rubber. The majority of manufacturers, however, believe that greatest economy is to be gained by employing solid rubber, the bandages being single for the front wheels and double for the rear. Only Delahaye and Malicet & Blin have boldly adopted metal bandages for both front and

THIRTY-SIX VEHICLES, REPRESENTING NINE DIFFERENT FIRMS, NOW BEING TRIED OUT UNDER ARMY AUSPICES TO DETERMINE UTILITY

rear wheels of their three-ton trucks, sticking to rubber for the smaller two-ton models. Berliet uses rubber for the front wheels and metal for the rear ones, thus making the economy of one pair of tires, and the same is done for the front-drive Latil; as these latter have no mechanism behind the dashboard, comparison is not possible. In connection with the steel bandages of the Delahaye trucks, it is interesting to note that two sets of superimposed springs are employed, the upper set being much lighter than the lower set. When running light the upper leaves carry the weight of the vehicle, and when fully loaded they are depressed until they come in contact with the lower set, the two pairs then working together as one. The arrangement appears to work to advantage, for it is obvious that the same stiffness of springs is not required for an empty platform as for the same platform with a three- or four-ton load on it.

As a test the vehicles have to pass one month on the road, running singly, in convoys, with and without load, and maintaining an average speed which in no case will exceed 15½ miles an hour. The daily runs will have to be made with gasoline, alcohol and benzol as fuel, the consumption being controlled on certain days and the amount of lubricant noted throughout the competition. The final basis of awards will be made on economy with these three fuels.

The following table shows the sizes of the motors engaged in the competition and the official weight of each vehicle fully loaded and without useful load. Under the latter heading is comprised the vehicle with all spare parts considered necessary, all tanks filled, bodywork, and driver.

THREE-TON SECTION

Maker	Motor	Weight empty, lbs.	Weight loaded, lbs.
1—Malicet & Blin	4 cyl. 90 x 120	6,613	13,522
2—Malicet & Blin	4 cyl. 90 x 120	6,613	13,592
5—De Dion-Bouton	4 cyl. 100 x 130	6,366	13,299
6—De Dion-Bouton	4 cyl. 100 x 130	6,520	13,261
7—Front-drive Latil	4 cyl. 105 x 140	6,425	13,546
8—Front-drive Latil	4 cyl. 105 x 140	6,458	13,646
13—Peugeot	4 cyl. 90 x 120	6,406	13,107
14—Peugeot	4 cyl. 90 x 120	6,426	13,346
18—Delahaye	4 cyl. 100 x 160	6,606	13,457
19—Delahaye	4 cyl. 100 x 160	6,113	13,514
22—Panhard-Levassor	4 cyl. 91 x 130	6,462	13,553
23—Panhard-Levassor	4 cyl. 91 x 130	6,534	13,566
26—Berliet	4 cyl. 100 x 140	6,595	14,651
27—Berliet	4 cyl. 100 x 140	6,593	14,631
35—Delaugere-Clayette	4 cyl. 90 x 120	6,595	13,073
36—Delaugere-Clayette	4 cyl. 90 x 120	6,613	13,007

TWO-TON SECTION

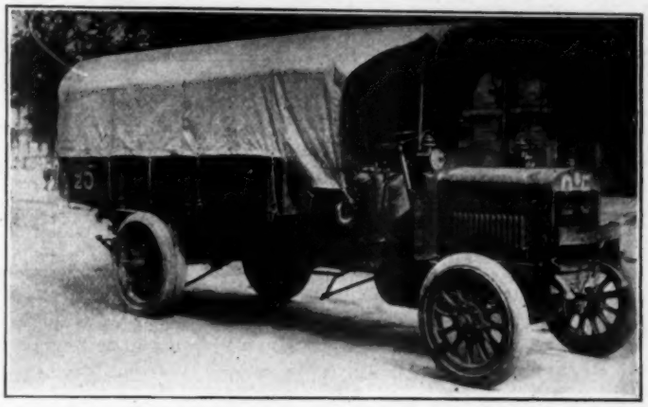
3—Malicet & Blin	4 cyl. 90 x 120	6,450	12,235
4—Malicet & Blin	4 cyl. 90 x 120	6,408	12,197
11—Peugeot	4 cyl. 90 x 120	5,485	10,634
12—Peugeot	4 cyl. 90 x 120	5,462	10,632
9—Front-drive Latil	2 cyl. 105 x 140	5,478	10,332
10—Front-drive Latil	2 cyl. 105 x 140	5,480	10,152
16—Delahaye	2 cyl. 100 x 160	4,695	9,298
17—Delahaye	2 cyl. 100 x 160	4,703	8,201
20—Panhard-Levassor	4 cyl. 81 x 120	6,399	13,323
21—Panhard-Levassor	4 cyl. 81 x 120	6,603	12,336
24—Berliet	4 cyl. 100 x 140	5,998	11,825
25—Berliet	4 cyl. 100 x 140	6,026	11,840
30—Vinot-Deguingand	4 cyl. 95 x 130	5,220	11,009
31—Vinot-Deguingand	4 cyl. 95 x 130	5,791	10,854

Benz, Not Mack, Gets Truck Trophy

On page 339 of THE AUTOMOBILE of August 25 it was said that "Mack Wins in Its Class." The information received by THE AUTOMOBILE at the time was to the effect that the Mack truck was slightly in the lead. It now transpires that the Benz truck was the winner, the figures being as follows:

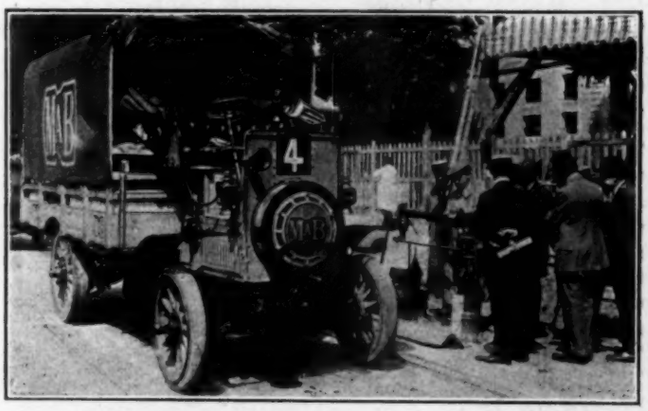
COST PER TON MILE AS FIGURED BY THE COMMITTEE

Car No. 72, Benz	$ .00736
Car No. 73, Mack	.00738



Another one of Berliet's heavy trucks

The Peugeot and Delahaye trucks on the road



Malicet-et-Blin truck being weighed on the scale at Meulan

The Peugeot auto truck in the competition

Doings in the East

NEW JERSEY AUTOMOBILE CLUB ACTIVE; CONTEST BOARD MAKING RULINGS; LANCASTER CLUB LOOKING AFTER ROAD WORK; QUITE A NUMBER OF NEW FACTORIES

—The Weed Chain Tire Grip Company announces that it will reduce the price of Weed chains to-day.

—The Automobile Accessories Company, William B. Yoder, president, has secured the Pittsburg agency for the Shawmut tires.

—George Sill Leonard, for some years with the Boston branch of the Studebaker company, is now with the Peerless company in the Hub.

—The Banker Wind Shield Company of Pittsburg is now fairly located in its new factory at Ellsworth avenue and Summerlea streets, East End.

—W. R. Cole & Son, of Oil City, Pa., have secured the agency for the Middleby automobile in Jefferson, Clarion, Armstrong, Clearfield and Indiana Counties, Pa.

—So complete has been the satisfaction given by Stearns taxicabs in Buffalo that the Buffalo Taxicab Company has just placed an order for seven more cars.

—William F. Lehman, veteran salesman in the automobile trade of Philadelphia, has joined the sales force of the Philadelphia branch of the Maxwell-Briscoe Company.

—Samuel Creese & Son, of Beaver Falls, Pa., have bought property on Seventh avenue in that place and will build a large automobile garage and repair shop at once.

—After losing nine horses, the Troy Laundry Co., of 172 Main St., Poughkeepsie, has purchased a gasoline delivery wagon from the International Harvester Co.

—The feature of the recent encampment of the N. G. P. at Gettysburg, Pa., was the use of a monster three-ton Packard motor truck for carrying the equipment and supplies.

—J. C. Howell has resigned his position as assistant manager of the Warner Instrument Company, to become advertising manager for Reed & Barton Company, at Taunton, Mass.

—Montgomery Hallowell, for several years connected with Lord & Thomas in New York, has been appointed general advertising manager of the United States Motor Company.

—The Franklin Motor Car Company, of 152 North Broad street, has contracted with the Cole Motor Car Company for the Philadelphia and vicinity selling rights of the Cole "30."

—The Whitten-Gilmore Company of Boston has added another former Studebaker man to its sales staff in Fred W. Nichols who has been selling motor cars in the Hub for some years.

—The Inter-State branch, that was opened in Boston this week, is located at 153 Boylston street, with Virgil A. Charles in charge. The entire New England business will be directed from there.

—A. J. Beckert, who was for several years connected with the firm of L. Glesenkamp Sons & Company, is now sales agent for the Willoughby Company and has his offices at Forbes Field, Pittsburg.

—The Stewart & Clark Manufacturing Company, makers of the Stewart speedometer, will open a sales office in Philadelphia. They are now negotiating for a very handsome salesroom on Broad street.

—Lucian Clawson and Elmer Turner, formerly of the Greensburg Auto Company, and Harvey Shoup are having plans drawn for a three-story garage in Maple avenue, Greensburg, Pa., to cost $20,000.

—The Castle Square Garage Company of Boston has taken on the Great Western for New England with headquarters on Ferdinand street. Subagencies will be placed in other New England cities.

—The Pittsburgh Automobile Dealers' Association is backing the movement to secure a new South Side tunnel which will give access to more than 100,000 people back of the Monongahela River hills.

—The Liberty Automobile Company, of Pittsburg, which was partly burned out recently, is now located at 5977 Centre avenue, East End. The company has recently taken the agency for the Abbott-Detroit car.

—Walter F. Winchester has severed his connection with the Pierce-Arrow Motor Car Co. of Buffalo, and hereafter will be head of the Winchester Motor Car Co., dealers in Pierce-Arrow cars, at Jacksonville, Fla.

—The location of the Stearns agency in Seattle has been moved from Fifth and University Streets to Broadway and Madison. The garage and salesrooms will be used exclusively in the interest of the Stearns in Seattle.

—H. C. & C. D. Castle has been merged into the Lozier Sales Company, of Boston, which will handle Lozier cars in the eastern half of Massachusetts. H. C. Castle, of the old firm, is president of the new Lozier Sales Company.

—Stillman & Hoag, Englewood, N. J., will continue handling the Locomobile and White gas cars during the coming season of 1911 and have taken the Chalmers-Detroit to replace the Buick line, which they have been handling.

—C. G. Norris, an English engineer is now in this country with two or three very interesting engineering novelties, one of which is the new type of wheel which has been adopted by the London Omnibus Company for its motor 'buses.

—The Consolidated Rubber Tire Company, manufacturers of the Kelly-Springfield tires, 315 North Broad street, Philadelphia, will shortly remove to 208 North Broad street. The floor space of the new quarters is nearly double that of the old.

—The city of Pittsburg will shortly build a model garage for housing its vehicles. It will hold the downtown fuel wagon of the fire department, the motorcycles of the police bureau and the city detectives' automobiles, and will cost $9,000.

—Vice-President and General Sales Manager of the United States Motor Company has announced that the Alden Sampson Manufacturing Company will build, in addition to its line of heavy commercial vehicles, a 1000-pound delivery wagon.

—Members of the New Jersey Automobile and Motor Club will take part in a sociability run Saturday, Sept. 10. It is expected that in the neighborhood of 100 cars will be in line, for the run is the first of the kind arranged for this season. The route the party will take will be from the city clubhouse in Park Place to the country club at Lake Apshawa, near Butler. On arrival there a clambake and corn roast will be the order.

—Vice-President Horace DeLisser, of the United States Motor Company, makes the announcement that that organization will hereafter be represented in all big racing and endurance events. Contest Manager M. C. Reeves will be in charge of the racing team.

—The Automobile Association of Indiana County, Pa., is prosecuting all road supervisors who do not comply with the laws for the betterment of country roads and its committee is making weekly trips over the five inspection districts to gather data.

—The first annual reliability run of the Automobile Club of Buffalo will start September 7 and will be concluded September 10. Both start and finish each day of the run will be from the club house on Main street and the course for each day will measure about 200 miles.

—Glenn H. Curtiss, the noted aviator, although completely absorbed in his work in which he has become a leader, recently purchased an Oakland runabout from the factory's representative, the Pittsburg Automobile Company.

—E. R. Mertens, superintendent of the Columbia Motor Car Company, has had ten cars of the 1911 model on the road in test. The new Columbia, which is of higher power than the 1911 car, is said to be very efficient. It has been demonstrated to be a hill climber and much is expected of it.

—The Howard Auto Transportation Company has been organized to conduct a passenger and freight service in Howard county, Maryland, within thirty days. The incorporators are Albert Nichols, Samuel A. Nichols, Samuel H. Hopkins, Covington Zepp and Stuart M. Bailey, all of Howard county.

—During the eleven months commencing August 1, 1909, and ending June 30, 1910, rubber was imported into this country to the extent of 96,000,000 pounds. This shows an increase of 13,000,000 pounds over the corresponding period preceding and over 24,000,000 pounds more than the same length of time in 1906-07.

—The National Automobile Company, capital $100,000, has been organized in Pittsburg and will take over the location formerly occupied by the Standard Automobile Company at 5917 Baum street. M. J. Caton is president of the new company, which will have the agency for the Owen and Haynes automobiles.

—The Hazard Motor Manufacturing Company, of Rochester, N. Y., has been incorporated, with a capital stock of $400,000, to take over the former Hazard Engineering Company. The officers of the new company are: E. C. Hazard, president; John F. Alden, vice-president; George R. Coates, treasurer; Willett E. Hazard, secretary; George E. Hazard, works manager.

—W. S. Drummond, organizer and former president of the New York Transportation Company, who is now engaged in the banking business in London and Paris, is in this country negotiating for the French rights to the Twombly automobile system and quick-removable power plant, which attracted so much attention from the trade experts when it was exhibited at the Automobile Club of America a few weeks ago.

—The Automobile Legal Association, of Boston, has been notified that Attorney-General O'Malley, of New York State, had rendered an opinion that motor cars bearing registrations of Massachusetts, Connecticut and Vermont did not come under the reciprocity clause of the New York law and therefore motorists from those States would have to register their cars to operate in the Empire State.

—The Matheson Automobile Company has just closed contracts with the following concerns: M. M. Gillett, Smethport, Pa.; W. King Smith Company, Syracuse, N. Y.; L. G. Everist & Son, Sioux City, Iowa; J. R. Todd, New Orleans, La.; Ideal Motor Car Company, Harrisburg, Pa.; J. M. Lopez, Biloxi, Miss.; J. K. Gilchrist Company, 123 East Seventh street, Cincinnati, Ohio.

—The S. M. Supplies Company, which has the Boston agency for the Inter-State and Brush cars for a year or more, has decided to drop its affiliation with the motor industry because of a press of other business. Victor M. Charles, manager of the agencies, will probably take charge of the Inter-State branch that is to be opened in Boston. It is expected that the Brush will also be handled as a branch through the U. S. Motors Company.

—The Collins Gear & Motor Company, of Pittsburg, has secured a location at Canonsburg, Pa., and will let contracts for a plant 60 x 300 feet at once. The company has a capital of $250,000 and will manufacture an appliance for automobiles invented by D. P. Collins at Pittsburg. Its officers are: President, J. J. Flannery; vice-president, D. P. Collins; treasurer, H. A. Neeb; secretary, J. M. Flannery. The offices of the company are at present at 324 Frick Bldg., Pittsburg.

—A four-cylinder 40-horsepower Pope-Hartford combination ladder and chemical wagon has been installed in Mansfield, Mass., for the fire department. The wagon cost $4,500 and is a thoroughly modern machine capable of carrying ten firemen and giving a speed of 35 miles an hour. It is equipped with a 40-gallon chemical tank and engine; one 20-ft. extension ladder; a 12-ft. ladder; two 3-gallon extinguishers; 1,000 feet of regulation fire hose; 200 feet of ordinary hose; axes, ropes and other things needed at fires.

—The C. W. Kelsey Manufacturing Company, of Hartford, Conn., has its first car on the road. It is called the Spartan and is a four-cylinder motor, three speeds, selective shaft drive, vestibule body and will seat four passengers. The car is to sell for $1,000, which includes lamp equipment, magneto and horn. C. W. Kelsey, president and general manager of the company, was formerly connected with the Maxwell-Briscoe Company as sales manager and recently resigned from a similar position with the Columbia Motor Car Company.

—The Boston *American* plans to have a contest for commercial vehicles on Oct. 14 and 15 starting from Boston and going to Newburyport the first day by way of Haverhill, Lowell and Lawrence, and the second day returning to Boston through Salem, Lynn, Beverly, Chelsea and Cambridge. It will cover about 130 miles and will be patterned after the Philadelphia *North American* contest from Philadelphia to Atlantic City recently. The machines will be divided into four classes of from 1000 pounds to anything over three tons, gasoline or electric. Officials of the Bay State A. A. will conduct it.

Middle West News

LOZIER CONCENTRATING AT DETROIT; INDIANAPOLIS SPEEDWAY BEING PUT TO WORK; PREMIER PLANT GETTING A TOUCH OF IMPROVEMENT; AGENCIES BEING ESTABLISHED

—R. L. Griggs will open a large garage to-day in Virginia, Minn.

—The number of automobiles in use in St. Louis has exactly doubled within eight months.

—The agency of St. Louis and territory for Continental automobile tires has been transferred to the Phoenix Auto Supply Company.

—The Anderson Carriage Co. of Detroit has opened a branch in Cleveland at Steeres' garage, 10550 Euclid avenue, with G. H. Rempes in charge.

—A. I. Dutton, Publicity Director of the Willys-Overland Company, has resigned to become sales manager of a prominent Chicago concern.

—A broad highway sixty miles long between Toledo and Detroit, traversing one of the most beautiful regions in the world, now seems a probability.

—Plans have been accepted for the $15,000 clubhouse which will be built by the Milwaukee Automobile Club, and the work of erection will start at once.

—T. L. Hausmann, late with the New York-Chalmers Company, has been appointed manager of the St. Louis branch, and is busy getting his sales force together.

—The Regal Motor Car Co. is soon to open a branch in Cleveland. A building has been leased for the purpose at 1926 Euclid avenue. Frank L. Pierce, formerly of the Gaeth Motor Car Co., will be in charge.

—A. A. Franklin & Company have been appointed factory distributors of the Cole "30" for Missouri. The company has offices and salesrooms at 4127 Olive street, St. Louis.

—A. R. Davis, manager of the Cleveland Studebaker Co., has been made a member of the Question Club, which is an exclusive club among automobile manufacturers and owners.

—The Scioto Auto Car Company of Chillicothe, Ohio, was incorporated with a capital of $150,000 to manufacture automobiles and motor trucks. The incorporators are F. C. Arbenz and others.

—The M. M. Baker Company, of Peoria, Ill., has leased a building at 2007-9 Locust street, for the establishment of a St. Louis house from which will be handled the Stoddard-Dayton and Courier cars.

—The Fayette County (Iowa) Automobile Association has just been formed, with the following officers: President, H. P. Hancock, West Union; Secretary, M. O. Musser, West Union; Treasurer, C. W. Bopp, Hawkeye.

—John G. Perrin, general superintendent of the Lozier factories at Plattsburg and Detroit, has just returned from an extended European trip taken for the purpose of studying the automobile trade and manufacturing conditions in general.

—H. W. Meyer, formerly of the Zimmerman Manufacturing Co. of Auburn, Ind., and more recently the Decatur Motor Car Co., of Decatur, Ind., is now general manager of the Planhard Manufacturing Co., carbureter manufacturers of Kokomo, Ind.

—The Standard Auto Sales Company has secured the lease of the first floor of the K. of C. Building in South Hazel street, Youngstown, Ohio, and will shortly move its garage, salesroom and repair shop there from its present quarters on West Rayen street.

—The Phillips Automobile Company has secured the agency of the Hudson Motor Car Company in St. Louis, formerly held by the Park Automobile Company. In addition to the Hudson, the Phillips Automobile Company will handle the Babcock Electric.

—The third annual good roads convention of the National Grange, Farmers' Union, American Road Builders' Association, U. S. Office of Public Roads, the National Association of Automobile Manufacturers and other organizations will be held October 6 to 8 at St. Louis.

—The *Tribune* Reliability run to Aberdeen, S. D., will start from Minneapolis either on Friday, Sept. 16, or two weeks later. It will last five days outgoing, one day at the Aberdeen control and two days returning, reaching Minneapolis on the night of the following Tuesday.

—Frank J. Santry, who has been for the last two years with C. C. Bleasdale in the Maxwell agency in Cleveland, has resigned and has accepted a position with Morgan & Williams, of Warren, Ohio, distributers in that section for Maxwell, Oakland, Overland, Oldsmobile and Columbia cars.

—E. B. Tozier of the Diamond Tire Company is having erected on Race street, just south of Ninth, in Cincinnati, a building of unusual architectural beauty. The structure is 24 x 120 feet, two stories and basement, and is to be occupied as salesroom and offices by the Diamond Tire Company.

—The Hitchcock Motor Company of Warren, Ohio, has been organized. M. H. Hood of West Farmington, Ohio, has bought the interest of J. H. Hitchcock and will be the president of the company. E. W. Skinner, for the past three years manager of the Bangora Slate Company at Columbus, Ohio, has bought the interest of R. H. Crehan and will devote his time to the company.

—The Henderson Sales Company of Indianapolis has selected Atlanta for its Southern headquarters, and will distribute from that city in the following States: North Carolina, South Carolina, Virginia, Tennessee, Georgia, Florida and Alabama. The local branch will be located at 76 Peachtree street and will be in charge of Leonard Cater.

—C. B. Warren has returned to the Haynes Automobile Co of Kokomo, Ind., resuming his old position of salesmanager. Mr. Warren left the Haynes Company in 1908 to represent the Stearns Automobile Co. on the Pacific coast, and later went into the retail business in St. Paul, Minn., with Burney Bird who represents the Haynes Co. in the Twin Cities.

—Mr. N. H. Miniter, formerly general factory representative of the Schebler carbureter and for the past year sales manager of the Eisemann Magneto Company, has been appointed sales manager of the Reichenbach Laboratories Company, manufacturers of the "Vortex Vaporizer." Mr. Miniter will make his headquarters at the home office of the company, 2420 Michigan avenue, Chicago.

—The seventh annual outing of the Milwaukee Automobile Club to the orphans of Milwaukee was a big success this year. The ride was to and from Washington Park, where the festivities were held. There were 101 orphans from the St. Rose's asylum, 90 from the Milwaukee Protestant Orphan asylum and many from the St. Aemilianus asylum, more than 200 in all, and each boy and girl was taken home at night an enthusiastic motorist.

—A record was established recently by a two-ton United States Motor truck on a three days' run from Cincinnati to Chicago. The distance of 361.4 miles was covered in about 26 hours and 15 minutes. Twenty-six gallons of gasoline and two and one-half gallons of oil were consumed on the trip. The demonstration was made by Norman S. Hill, sales manager of the United States Motor Truck Company of Cincinnati, and E. C. Schumard, general superintendent of the same company.

—According to advices from the course, the winning Lozier car in the Elgin National Trophy race was equipped with Michelin tires as were also the National that finished second in that contest and the one that got third money. In the Illinois Trophy race the winner, a National; Falcar, second and Marmon, third, ran on Michelin tires. The winning Marmon in the Kane County Trophy race as well as the Marion which finished second and the Marmon that was third were all similarly equipped.

—At the annual meeting of the Firestone Tire & Rubber Company, held in Akron, August 24, the former board of directors was retained and the following officers were re-elected for the coming year: H. S. Firestone, president and general manager; Will Christy, vice-president; S. G. Carkhuff, secretary and J. G. Robertson, treasurer. It was announced that the new model tire plant now in process of construction will be completed by February, increasing the manufacturing capacity fourfold.

—The Stover Motor Car Company of Cincinnati was incorporated with an authorized capital stock of $25,000 to manufacture and sell motor cars and other vehicles by L. K. Emerson, George W. Platt, R. L. Dallings, Stanly M. Adams, Parker K. Gale and Alex. L. Parker. The American Auto Sales Company of Cleveland was incorporated with an authorized capital stock of $50,000 to do a general automobile and repair business by George H. Canniff, John K. Corwin, E. P. Kinney, W. W. Welch and Frederick P. Walters.

—The Milwaukee Automobile Club will furnish the automobile to make the five-mile race with an aeroplane at the State fair here September 13-17. Indications are that the Milwaukee Automobile Club will inaugurate with a motor parade the opening day of the Wisconsin State fair and with this end in view has asked that, if possible, the new Grand avenue viaduct, one of the largest concrete bridge structures in the world, may be completed for traffic during State fair week. Plans are to have the viaduct used for the first time by the parade.

—The Louisville Automobile Club's second annual reliability and economy contest will be held September 20, 21 and 22 and two of the cars which participated in the 1910 Glidden tour will probably enter. The Cole car and a Premier will likely be named. Entries have been received and several numbers have already been assigned. The tour this year will cover about 500 miles through the Bluegrass. Three silver loving cups are offered this year—one for economy, another for the best reliability score and the third prize is called the owner's cup.

From the Sunny South

THE PRESENT MONTH WILL SEE NASHVILLE THE HOME OF THE ONLY AUTOMOBILE FACTORY BELOW MASON & DIXON'S LINE—GENERAL TRADE NEWS

—A charter has been granted the Jackson, Tenn., Garage Company of Nashville, Tenn. The capital stock is $10,000 and the incorporators are: Chas. E. Dexter, F. M. Spiller, Mark Glen, and J. A. Pope.

—Amateur and professional automobile men of Texas, elated with the success which attended the recent meet on Galveston Beach, are beginning already to formulate plans for a more extensive meet next year.

—The Governor of Tennessee has announced the appointment of a large number of delegates to the Southern Appalachian Good Roads Convention to be held in Knoxville, Tenn., during the Appalachian Exposition at that place. The convention opens on Sept. 12.

—The Regal Company of Detroit has opened a Southern branch at 380 Peachtree street, Atlanta, under the name of the Southern Regal Auto Company of Georgia. This company will have Virginia, North and South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas and Tennessee as its territory.

—*The Exhaust* is the title of a new automobile journal, the first number of which will be issued on Sept. 5th. It will be published by the Exhaust Publishing Company, 204 Stahlman Building, Nashville, Tenn. Charles C. Gilbert, secretary of the Nashville Automobile Company, is the editor.

—The first Baltimore chauffeur to have his license suspended for using his owner's car without the latter's consent is Frank T. Trainor. The action was taken by Motor Vehicle Commissioner John E. George under the new Swann Motor Vehicle Law. The owner and the Automobile Club of Maryland, through the club's counsel, Osborne I. Yellott, prosecuted the case.

—The city of Nashville, beginning to-day, will oil all new streets that are built and all old ones that are repaired, expecting in this way to ultimately get most of the streets of the city oiled, excepting of course the uptown paved streets. Rock is abundant at Nashville and all of the streets are well built, but unfortunately the rock is soft limestone, wears rapidly and makes a tremendous amount of fine dust, so much so that it is necessary to sprinkle all of the streets of the city daily.

—By the middle of September the Southern Motor Works, said to be the only automobile manufactory in the South, will be turning out Marathon cars from its Nashville plant at the rate of five per day, according to plans. The plant has really been running for several weeks, but all of the equipment has not yet been placed in position. About 75 men are now employed, but the force is to be rapidly augmented until it reaches 400. The plant is located in a big brick structure that was formerly a cotton factory and with some remodeling has made a very desirable place for its present purpose. The plant was formerly located at Jackson, Tenn., but was removed to Nashville, the capital largely increased and operations greatly enlarged. Only two models were turned out at Jackson, but the Nashville factory will begin with four, roadsters, touring cars, as per the old patterns, and the same with torpedo body. C. H. DeZevallos will have charge of the uptown agency.

Across the Great Divide

FRANKLIN SMASHES COAST RECORDS; FRISCO GETS NEW AGENCIES; PORTLAND IS AWAKENING TO MANUFACTURING; ALAMEDA ESTABLISHING AUTO SERVICE

—The Pacific Motor Car Company, of San Francisco, has just taken over the agency for the Reo car.

—The Cole Motor Car Company will establish a branch house at San Francisco. F. W. Cole, Jr., will be in charge as manager.

—The Glenn County Garage, at Willows, Cal., has taken the agency in that district for the Studebaker, E-M-F and Flanders cars

—The Morrison-Cole Motor Car Company, which it is now officially announced will handle the Cadillac in San Francisco, has been recently organized for that purpose.

—Rene J. Marx, manager of the Pacific Coast branch of Renault Frères, announces that the Renault car has been taken over by the Portland Taxicab Company.

—Max L. Rosenfeld, San Francisco agent for the Apperson car, has leased the stores formerly occupied by the Pullman and Dorris agencies on Golden Gate avenue.

—The city of Alameda, Cal., has just put in commission a Pope-Hartford combined police patrol and ambulance. It is a 50-horsepower machine and will accommodate twelve persons.

—The E. S. DeTamble Company will be exclusive Pacific coast distributers for the DeTamble line of cars covering all territory west of Denyer, including the Republic of Mexico.

—The Middleton Motor Car Company has been incorporated in San Francisco, with a capital stock of $50,000, by W. H. Middleton, W. C. Crittenden, E. P. Cooper, S. B. Holman and C. C. Burr.

—C. F. Splitdorf, the well-known manufacturer of ignition specialties, has just opened a branch at 1226 South Olive Street, Los Angeles, Cal. P. M. Graves will have charge of the new branch.

—The Elmore car is to have a new home in San Francisco. A. J. Smith, the Pacific Coast distributer, has taken a five-year lease of a new permanent building which is to be erected on Golden Gate avenue, near Van Ness avenue.

—The Ajax Auto Traction Company, of Portland, Ore., has let contracts for the construction of a large manufacturing plant, and has ordered a complete machine shop equipment. The company is capitalized at $500,000, and is backed by a number of prominent Oregon business men.

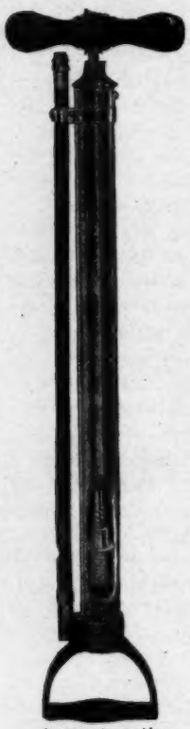
—The Monitor Automobile Works, 206 N. Academy St., Janesville, Wis., formerly of Chicago, has just opened a Los Angeles agency with the C. G. Dwight Auto Co. This concern is one of the best known in Los Angeles and will push the Monitor commercial car among the merchants of that city.

—Two record-breaking performances marked the recent trip of a score of air-cooled Franklin cars from Portland, Ore., to the Government camp on Mount Hood. A one-ton truck of 18-horsepower made the climb carrying 2,600 pounds of dead weight, and G. L. Campbell drove his six-cylinder 48-horsepower car, carrying seven persons up to the camp, 50 miles, in two hours, consuming but 12 gallons of gasoline.

Prominent Automobile Accessories

USEFUL EMERGENCY WHEEL

Time lost by reason of tire trouble is frequently a big factor to the autoist, and any device which can save him a quarter of an hour or more—with its consequent fuming and fretting—is not to be ignored. Such a device is the Jenkins emergency wheel, made by the factory of the same name in Richmond, Va. As the primary consideration, ease and quickness of application have naturally been first considered in this wheel, although the element of strength has not been overlooked in its make-up. It will fit any make of wheel or rim.

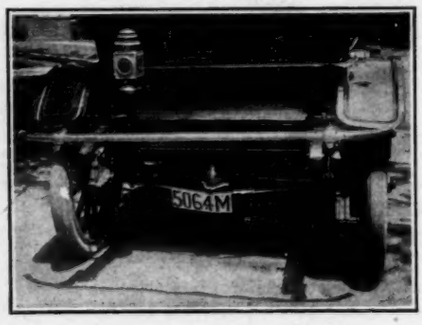


A quick-action hand pump

Six steel plates firmly fastened to the emergency rim form seats upon which the rim of the regular car wheel rests when it is in place. The emergency wheel is held in place against the side of the car wheel by three steel arms, which reach through the inside of the car wheel and engage the inner edge of the rim. The simple tightening of the three bolts on the outside of these three arms holds the emergency wheel fast to the car wheel, forming a strong positive support that cannot give way.

The regular car wheel cannot be harmed by the emergency wheel, for when the latter is in place no part of it comes in contact with the injured wheel. Steering is not interfered with when the substitute has once been firmly placed, and any car so equipped may be driven a hundred miles or more without trouble.

In Fig. 1 is shown the left front wheel with its *hors de combat* tire jacked from the ground and the operator loosening the nuts on the three steel arms which reach through the car wheel and engage the inner edge of the rim. Fig. 2 shows the operator placing the emergency wheel on the outside of the car wheel that is out of commission, and turning the arms so that they will engage the inner edge of the rim of the latter. In Fig. 3 the operator is tightening up the nuts at the outside end of the three steel arms, after which he is ready to proceed. The whole operation consumes but very little time—experts have been said to perform it in considerably less than a minute.



Rear fender to save tail lamp, fenders, gasoline tank and body

SAVES ROOM AND DOES THE WORK

The combination-filter, measure and funnel here shown is a very compact and handy item in a car's outfit. It is made by Charles R. Gibson, of Salamanca, N. Y. Just above the handle is a spring lever, pressure upon which opens the funnel and allows the oil to run through the filter after the proper amount has been measured.

EASY-ACTION, POWERFUL HAND PUMP

Inflating tires by hand is such an exhausting procedure that the motorist whose car is not equipped with one of the mechanical pumps should see to it that the hand pump he carries is powerful and easy-working. The Myers Airtite, manufactured by the Keystone Novelty Company of Columbia, Pa., possesses merit along these lines that should recommend it to the autoist. With no leather parts and with metal piston and expansion rings like those in the cylinder of an engine, it is positively air-tight, and being made throughout of brass, steel and iron, it will outlast many of the ordinary pumps.

Measure, funnel and filter in one

REAR FENDERS FOR AUTOMOBILES

Automobiles, used in the larger cities, that are not equipped with fenders are as difficult to find as the proverbial needle that got in the way of the hay stack. In thus equipping their cars, owners have mechanically followed the custom of attaching a fender only to the front of the car. Automobile mechanics have for some time sought to provide some adequate means for protecting the rear axle, gasoline tank, tail lamp, body and fender. It would seem that their problem is solved by the simple expedient of attaching a bumper to the rear spring hangers.

The accompanying illustration shows that a Detroit motorist has seen the utility of this idea and has attached a "Swivel-action" bumper to the rear of his car. These fenders are being marketed by the Emil Grossman Company, 232 West 58th street, New York City.

Fig. 1—First operation in adjusting Jenkins Emergency Wheel

Fig. 2—Second operation, fitting emergency wheel in place

Fig. 3—Final operation, tightening nuts at ends of steel arms